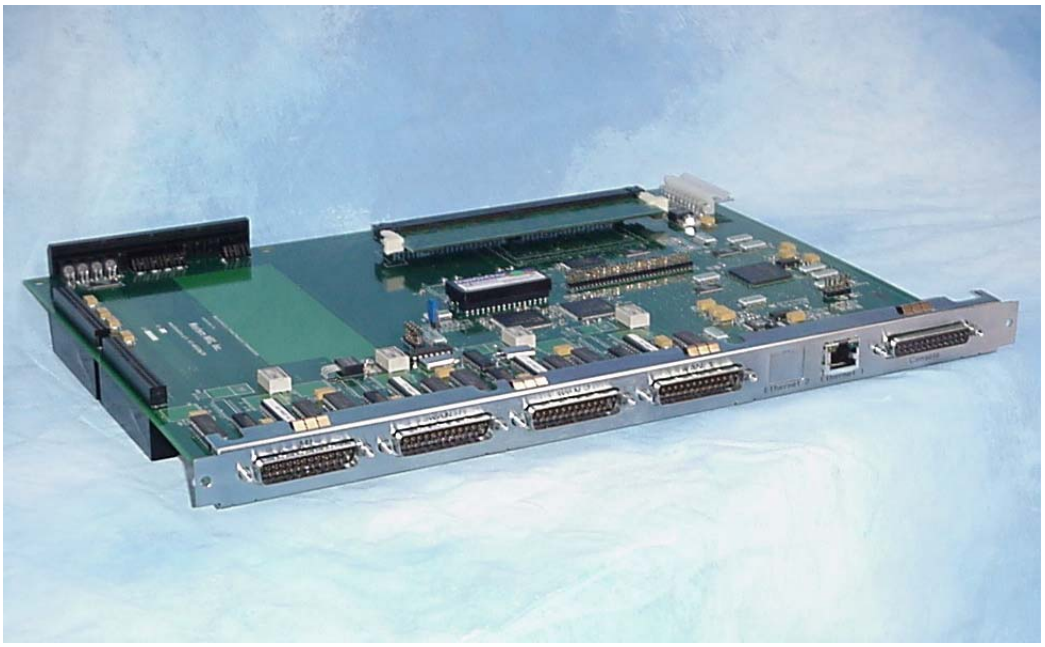
MAGNUM ROUTER
User's Guide
Release 2.0



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About this Guide

The Magnum Router User's Guide describes how to install and configure the Magnum Router. The Magnum Router is shipped with the Magnum GUI (graphical user interface) Manager, a configuration and management software for Windows 95, 98, 2000, ME, XP and NT Workstation 4.0. The Magnum Router GUI Manager and all its features are detailed throughout this guide.

Additionally, this guide provides a brief introduction to Frame Relay and offers sample configurations.

The Magnum Router User's Guide is divided into two parts.

Part 1 - About the Magnum Router.
Part 2 - Using the Magnum Router GUI Manager.

Part 1

Containing chapters 1 through 4, Part 1 describes the Magnum Router itself, and what's required to get the unit up and running.

Chapter 1 – Introduction and Overview
Chapter 2 - Before You Begin
Describes the Magnum Router and its features and specifications. Also explains what you'll need for installation.
Chapter 3 - Planning and Preparation
Suggests how you might plan the Magnum Router installation and configuration in advance.
Chapter 4 - Installing the Hardware
Explains how to install the Magnum Router into a Marathon chassis.

Part 2

Chapters 5 through 10 comprise Part 2 of the User's Guide. These chapters explain how to install the software, and detail the many features of the Magnum Router GUI Manager.

Chapter 5 – Magnum Router Manager software Installation
Explains how to install the Magnum Router GUI Manager on your computer.
Chapter 6 – Logging onto a Magnum Router
Details how to access a Magnum Router from the Magnum Router Manager.
Chapter 7 – Magnum Router Manager GUI Manager
Describes the various functions of the Magnum Router Manager.
Chapter 8 – Magnum Router Manager Specialized Functions
Describes the functions that are exclusive to the Magnum Router Manager.
Chapter 9 – Sample Configurations
This chapter gives some real world examples of how to program the Magnum Router.
Chapter 10 – Troubleshooting
This chapter gives some common problems and solutions to problems that may occur with the Magnum Router.
Chapter 11 – Cable Specifications
This chapter covers the cables used in connecting the Magnum Router to other devices.
Chapter 12 – Marathon Configuration
This chapter covers the steps required to program a Micom Marathon to function with the Mangum Router.

Conventions Used in the Manual
Throughout this user manual, some information is outlined to inform of important items regarding the section.

Text with this icon is to inform of cautionary information

Text with this icon is to inform of general information

Text with this icon is to inform of information that could cause errors if programmed or used incorrectly

Text Bolded and Italicized text will denote a command button or a menu item in the Magnum Router Manager.

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Chapter 1: Introduction

Introduction

Congratulations on your purchase of the Magnum Router Module. The Magnum Router Module is a high performance IP Router and Frame Relay Switch. With the Frame Relay Switch, you can create a private network, access a public frame relay service, or build an integrated hybrid network with multiple carriers, offering public and private services.

About the Magnum Router

The Magnum Router is designed to enhance the existing Marathon data-voice integration family of products by providing both increased WAN speeds and high performance IP Routing. The Magnum Router is manufactured for use in a new or existing Marathon base unit to allow for use of legacy serial data (both synchronous and asynchronous) as well as our ClearVoice (compressed data-voice technology) and high performance IP Routing over public and private networks. The Magnum operates over public Frame Relay networks as well as dedicated digital data networks with speeds ranging from 56Kbps to full or fractional T1/E1 speeds. While this guide discusses primarily Frame Relay networks, the Magnum is **definitely intended for use over dedicated links**. The configuration of the WAN ports within the Magnum Router will always be frame relay to take maximum advantage of this product's design.

The Magnum Router can also encapsulate various protocols such as serial data and Micom Clear Voice G.729 voice compression technology into IP packets for transport across any IP network. This feature is known as Microband VoIP (or MVoIP). This means that the Magnum may be used to transform your Marathon base unit into a serial data over IP and or compressed voice over IP engine. By using the Magnum as a DOIP (data over IP) or VOIP (voice over IP) engine, you can bundle Marathon legacy asynchronous data, Marathon Clear Voice and high performance IP traffic all out the single 10/100Mpbs Ethernet interface for transport across your private or public IP network. **We cannot guarantee the quality of service over public IP networks such as the public Internet.** *The Magnum Router module is specifically designed for use over public Frame Relay and dedicated digital networks.*

The Magnum Router module fits neatly into a new or existing Marathon base unit chassis. It is intended for use in the Marathon 2K, 2Kplus, 3K, 5K Turbo, 5K Turbo Pro, 10K, 20K, 20K Pro and Netrunner 75E base units with software revision 5.0 or later. The Magnum Router module is not Marathon CCM (central control module) dependent. The Magnum Router module is both a fully functional frame relay switch and high performance IP Router in one. It may function as a standalone product by simply installing it into a Marathon chassis. However it is most popularly used in conjunction with your existing Marathon network to preserve your data-voice integration technology investment.

Chapter 2: Magnum Router Features

Scaleable

The Magnum Router's 4 Serial WAN architecture allows enterprise networks to scale from multipoint frame relay networks to multiple dedicated digital networks or a hybrid network of carrier frame relay and dedicated networks.

Marathon Modularity

Field installable in any new or existing Marathon or Netrunner with software version 5.0 or greater.

IP Features

Supports industry standard Ethernet TCP/IP Routing
Supports dynamic routing (RIP Version 1)
Functions as a DHCP Server
Microband VoIP / a.k.a. IP Encapsulation

> IP encapsulation for all legacy Marathon traffic types such as Voice / Fax compressed call traffic and synchronous / asynchronous legacy data, making the Marathon product ready to traverse any new or existing IP network infrastructure including the Internet.

Compatibility

The Magnum Router is compatible with other manufacturers RFC1490 compliant products to form Magnum to Magnum plus Magnum to brand (X) networks.

Configuration

The Magnum Router Module is easily configurable entirely from the Magnum Router GUI (graphical user interface) Manager.

Magnum Router Specifications

Microprocessor

Motorola MPC-860T, 50Mhz

Memory

64 MB SDRAM, 2MB FLASH, 16MB FLASH DISK-ON-CHIP

Interface Connections

One male DB 25 V.35 (M1), Three male DB25 V.35 WAN ports, One female DB25 RS-232 console port, One RJ 45 10/100 Base T Ethernet port.

LAN Connection

Ethernet: auto-sensing 10/100 Base-T UTP.

WAN Connection

3 T1/E1 WAN ports support data rates from 56Kbps to 2.048 Mbps

IP Routing

Incorporates industry standard IP routing

DHCP Server

Works as a network DHCP Server for workstation configuration.

Performance

Forwarding Rate: 4000 packets per second.

Aggregate Sustained Throughput: 20 Mbps

Frame Relay Support

DLCI's/PVC's: Unlimited

Frame Size: 2K

Compatibility

The Magnum Router is compatible with other manufacturers RFC 1490 compliant products.

Must reside in a new or existing Marathon Base Unit Chassis: 2K, 2K+, 3K, NR75E, 5Kturbo, 5KTPro, 10K, 20K, 20Kpro. All Marathon units must be software revision 5.0 or greater.

Standard Compliance

T1.617 ANNEX-D, ITU Q933-ANNEXA

ITU I.233, ANSI T1.606

ITU Q922-ANNEXA, ANSI T1.618

Management Options

Windows based PC with GUI interface.

Models

M5000M/R1, Magnum Router Module

M5000M/SR1, Magnum Router Standalone Version

Cables (included)

M5000C/CAT5E, Ethernet port cable.

M5000C/CP, console port cable.

M5000C/MODEM, Magnum Console to Modem Cable

M5000C/MATRIX, Magnum Console to Marathon Async Cable

Agency Compliance

ISO 9000 Certified

Storage Temperature

55 to +85 C

Operating Temperature

0 to +50 C

Operating Humidity

Up to 95% non-condensing

Operating Air Pressure

10,000 feet (3050 m) maximum altitude

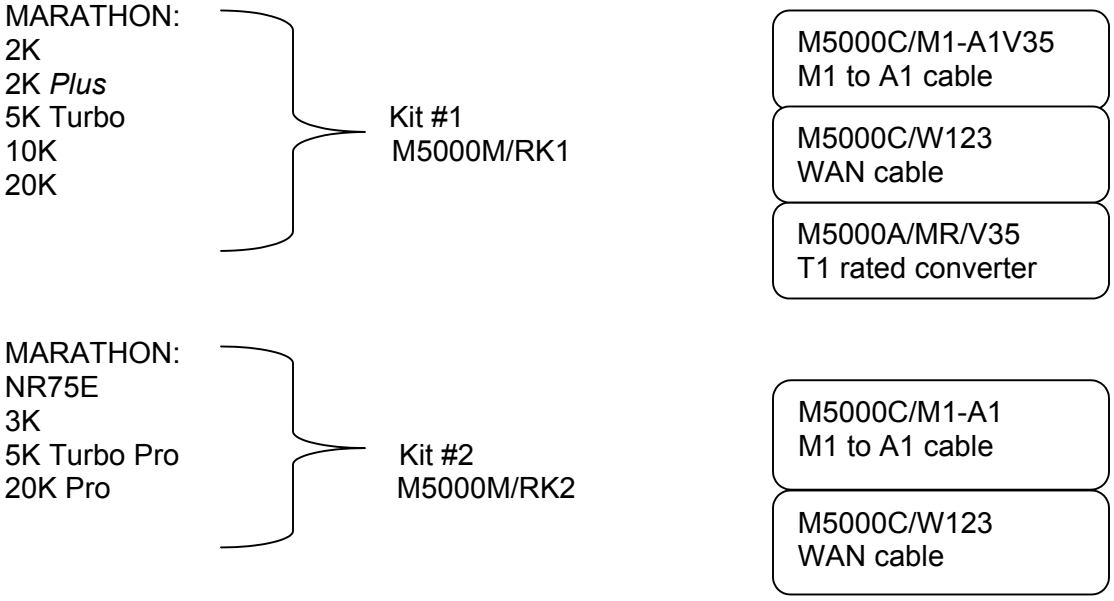
Installation Requirements

The following items will be required to install and operate the Magnum Router module:

- A Marathon base unit.
- The Magnum GUI Manager software (included), running on a PC with Microsoft Windows 95, 98, 2000, ME, XP or NT workstation 4.0.
- An available PC COM port. (DB9F to DB25M console cable included)
- Appropriate cables:

(Please see the applicable cable kits in the illustration below)

MAGNUM ROUTER CABLE KITS



To use cable kit #2, A1 must be strapped for V.35.

A CSU/DSU or similar communications device for each WAN (wide area network) connection desired.

Chapter 3: Pre-Installation

Planning and Preparation

Installing and configuring a Magnum Router module / Marathon system takes some up-front planning. It is advisable to consider a number of configurations before deciding on the one that is best for the specific application. Before actually connecting equipment to the Frame Relay or dedicated digital network, it is suggested that the planning and preparation guidelines outlined below be followed.

Planning the Magnum Router / Marathon Installation

It's a good idea to create a drawing, mapping out the physical layout of the network. Include all Magnum Router / Marathon units and all related CSU/DSU's. Make sure to indicate the following on the drawing:

- Magnum Router WAN port orientation.
  Such as DTE (connected to CSU/DSU or other DCE device) or DCE (directly connected to additional FRAD's or routers, bridges or other DTE devices).
- The speed of each connection.
- The path of each PVC, using dotted lines.
- The DLCI numbers to be used for each end of each PVC, if your network is public Frame Relay.
- Available bandwidth for each PVC (CIR).

After successful installation of the Magnum Router / Marathon, retain this drawing for future reference to aid in troubleshooting.

Planning the Configuration

The Magnum Router module is shipped with a default configuration. However, in most instances, the default configuration will have to be changed to suit the installation's specific requirements.

The default configuration provides one DCE port (set for 128K, internal clocking, Frame Relay lmi type: Annex D) on port M1 for connection to your new or existing Marathon base units A1 port via the appropriate M1-A1 external cable and one WAN DTE port (set for Frame Relay lmi type Annex D) on port WAN1.

By default, ports WAN2 and WAN3 are disabled, and need to be enabled through the Magnum Router Manager software.

The default IP address of the 10/100 Base-T E1 port is 10.1.100.250 with a subnet mask of 255.255.255.0 and the WAN IP address is 192.168.1.1 with a subnet of 255.255.255.0

The Magnum Router module also comes with a DB25 (RS-232) console port for connection to a local PC communications port or dial modem for use with the Magnum Router GUI Manager software (included). The console port default settings are 9600bps, no parity, 8 bits, 1 stop bit.

The following items are also helpful (if not critical) for the planning phase to be completed:

- Determine the Name of your Magnum Router
- Determine the WAN Configuration (Port Settings)
- Determine the Master WAN IP Address
- Determine the WAN-IP Route Map information
- Determine the Ethernet Port IP Address

Planning Worksheets

Located in chapter 13 is configuration planning worksheets to assist in the programming of the Magnum Router.

Chapter 4: Installing the Hardware

Cable Kit Notes

The cable kit M5000M/RK-1 will work with any Marathon base unit, however if the Marathon base unit that the Magnum Router is being installed into is a 75e, 3K, 5KT Pro or a 20K Pro; then it is important that the jumper settings for the A1 port be set for RS-232 operation.

The cable kit M5000M/RK-2 is designed to work only with jumper selectable Marathon base units (75e, 3K, 5KT Pro, and 20K Pro) as these units allow the A1 port to be changed from RS-232 operation to V.35 operation. This cable kit will not work on Marathon units 2K, 2K Plus, 5K Turbo, 10K and 20K.

Verify the Marathon base unit, and jumper position (if necessary) before installing the Magnum Router.

Installing the Magnum Router Module into the Marathon base unit

Follow these steps to install the hardware.

1. Remove the power cord from the Marathon base unit. Remove the top cover. Remove all of the necessary "blank" back plane dividers and internal module spacers (found at the front of each module, nearest the LED's).

2. Determine which level within the back plane the Magnum Router module is to be installed. It is recommended that the Magnum Router be installed in the last module slot or upper-most slot within the Marathon stack.

   The Marathon CCM does not recognize the Magnum Router. This means that if the Magnum is placed in the "B" slot, and the card above it is set for "B", there will not be a conflict. However, to eliminate confusion it is recommended that the Magnum Router be placed in the top most level of the Marathon unit.

3. Install the module in the Marathon chassis like any other Marathon expansion module paying close attention to the placement of the 2 "50 pin bus connectors" on the right side of the module. Apply a reasonable amount of pressure over the bus connectors to ensure the module is properly "seated" then re-install the necessary module spacers at the front of the module. Using the screws removed from the step 1, fasten the Magnum Router sheet metal back plane to the Marathon chassis and re-assemble the required number of blank back plane dividers.

4. Re-install the Marathon base unit top cover and the 4 black screws to hold the top cover in place.

5. Connect the appropriate M1 to A1 cable from the M1 port of the Magnum Router to the A1 port of the Marathon base unit. Connect the appropriate WAN port cables to their respective CSU/DSU's Connect the manager console cable.

6. Power on the equipment.

This completes the hardware installation of the Magnum Router.

Chapter 5: Magnum Router Manager Installation

About the Manager Software

The Magnum Router GUI Manager is a configuration and management software for the Magnum Router that runs on Windows. The Manager functions much the same as other Windows programs.

The following will be required to install the software:

- The Magnum Router GUI Manager installation disk.
- PC with a hard drive that has at least 2 Mb of available space and a CD-ROM drive
- Windows 95, 98, 2000, ME, XP or NT workstation 4.0 PC operating system

If this is an upgrade from a previously installed version of the Magnum Router Manager, follow the “Upgrading” steps below.

In some cases, the Setup program needs to do a pre-installation of certain support programs, and then requires a reboot for these programs to take effect. If this occurs, after the reboot, just restart the Setup program as outlined below.

Installing Manager Software

The Magnum Router GUI Manager is installed much the same as any Windows software.

Follow these easy steps:

Exit all open Windows programs.

Insert the Magnum Router GUI Manager cd in your computers cd drive.

The Setup program should automatically start. If it does not, click on My Computer and select drive x: (where x is the CD-ROM drive) and double-click on the Setup program.

Once the Setup program is started, the pre-installation screen will be displayed as shown below:

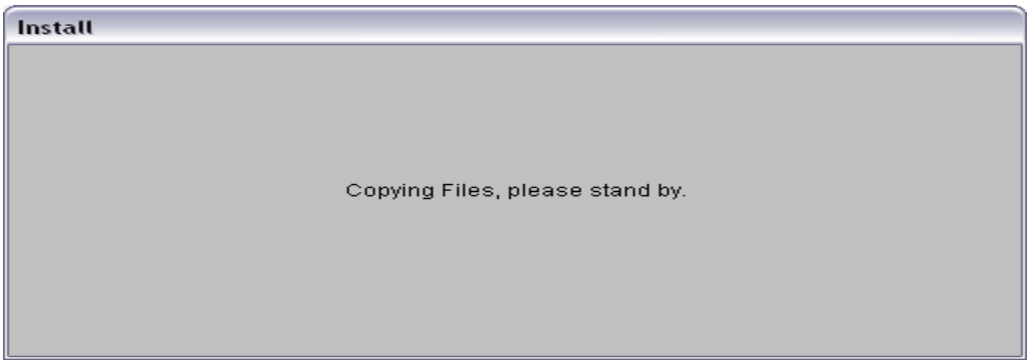


Figure 1 - Setup Pre-Installation Screen

After the pre-installation screen has completed any checking, the main installation screen will be displayed:

Magnum Router Manager Setup
Welcome to the Magnum Router Manager installation program.
Setup cannot install system files or update shared files if they are in use. Before proceeding, we recommend that you close any applications you may be running.
OK
Exit Setup

Figure 2 - Setup Confirmation Screen

Click on ***OK*** to continue the installation, or click ***Exit Setup*** to abort the installation.

If ***OK*** was clicked, the select directory/perform installation screen will be displayed.

Magnum Router Manager Setup
Begin the installation by clicking the button below.
Click this button to install Magnum Router Manager software to the specified destination directory.
Directory:
C:\Program Files\Magnum Router Manager\
Change Directory
Exit Setup

Figure 3 - Setup Install and Directory Screen

Under most conditions, the selected directory (C:\Program Files\Magnum Router Manager) is where the program will be installed. If the program needs to be installed on another hard drive, or another directory, click on Change Directory and select the appropriate drive and directory location to install the program.

Click on the Setup button at the top of the screen to continue the installation.

Figure 4 - Setup Program, Program Group

During the installation, the setup program will request a program group. By default, the program group is Magnum Router Manager. Enter another Program Group name, select one from the list, or click on ***Continue*** to proceed.
After clicking the Continue button, the setup program will install the Magnum Router Manager files into the disk/directory selected earlier.

Depending on software that may already be installed on the PC, a Version Conflict message may appear as shown below

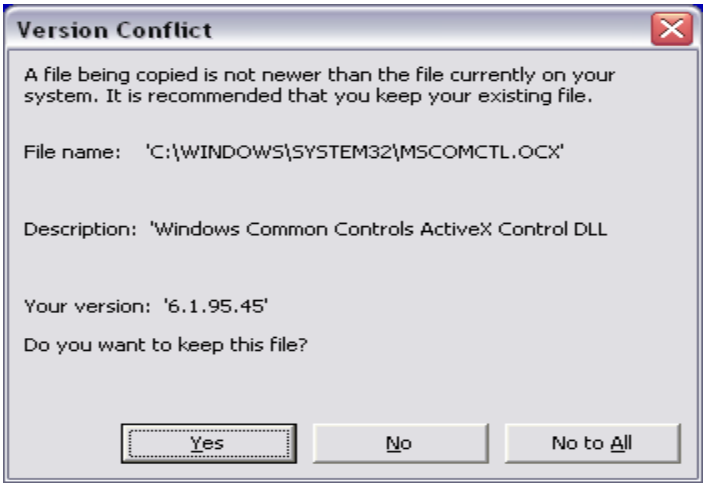

Version Conflict
A file being copied is not newer than the file currently on your system. It is recommended that you keep your existing file.
File name: 'C:\WINDOWS\SYSTEM32\MSCOMCTL.OCX'
Description: 'Windows Common Controls ActiveX Control DLL
Your version: '6.1.95.45'
Do you want to keep this file?
Yes
No
No to All

Figure 5 - Setup Program, Version Conflict Screen

If this message appears, it is advised that the newer file is always kept. In the above example, ***Yes*** was selected to keep the existing file.

Once the installation process has completed, the setup program will display the following message:

Figure 6 - Setup Program, Installation Complete Screen

Click on ***OK*** to return to the windows desktop.

Upgrading the Magnum Router Manager

If an earlier version of the Magnum Router manager has already been installed on the PC, it has to be removed before installing the newer version. To uninstall the previous version of the Magnum Router Manager, do these following steps:

- Click on Start
- Click on Settings
- Click on Control Panel
- Click on Add/Remove Programs
- Click on the Magnum Router Manager entry
- Select Remove Program

Once these steps have been completed, return to the installation steps in the first part of this chapter.

Additional Folders

During the setup process, the program also creates some additional directories. One is the *DOCUMENT* directory that contains a copy of this manual. Another is the *SAMPLES* directory that contains the configuration samples located in this document.

Starting the Magnum Router Manager

To start the Magnum Router Manager, perform the following steps:

- Click Start
- Click Programs
- Click Magnum Router Manager
- Click the Magnum Router Manager icon

First-Time Startup

When the Magnum Router Manager first starts, it looks for setup information. If this is the first time that you're running the manager, the communication port settings screen will appear.

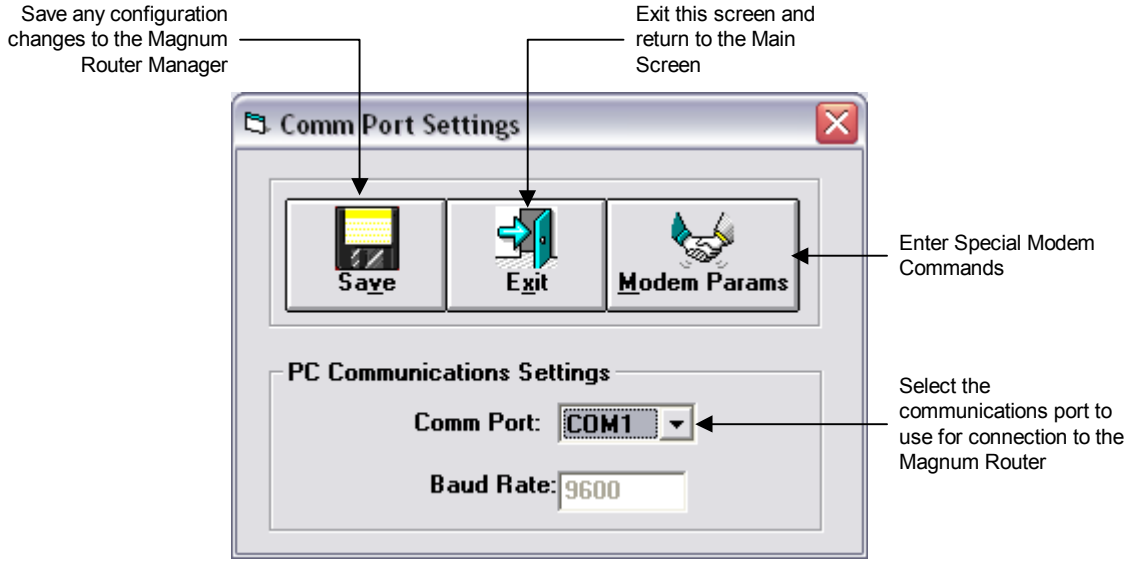


Figure 7 - Communication Port Setup Screen

Select the PC's communications port that is to be used to connect to the Magnum Router by clicking on the ***Comm Port*** dropdown box. When you've completed that step, click on ***Save*** to save this setting and then click on ***Exit*** to start the manager and get to the login screen.

If for some reason another communications port needs to be selected, clicking on the ***Settings*** on the Main Screen menu bar, then select ***Communications Settings*** from the dropdown menu. From the ***Comm Port Settings*** window select the appropriate communications port. The Magnum Router console port baud rate is set at 9600bps from the factory and cannot be changed.

This is the serial setup for communications from the PC to the Magnum Router console port and does not have anything to do with a modem dial-up environment.

Once the initial setup has completed, the login screen will be displayed.

Chapter 6: Logging Onto a Magnum Router

After the initial installation of the Magnum Router Manager software and it's setup, the main login screen is displayed. This screen is only displayed when the Magnum Router Manager is first started or when the ***Login to a Magnum Router*** menu item is selected from the ***Access*** menu.

This chapter covers the various methods of logging onto a Magnum Router and how to connect various equipment to allow the Magnum Router Manager to logon to the Magnum Router.

Connecting to a Magnum Router

As will be discussed in more detail later in this chapter, there are 4 methods of logging onto a Magnum Router. Each method has a different cabling requirement – each is covered in this section.

Console Cabling

To create a console login, first attach a straight-thru cable from a PC's communications port to the Magnum Router's console port. Included with the Magnum Router is a DB-9 to DB-25 console cable labeled M5000C/CP. If the interface on the PC's interface is a DB-25 and NOT a DB-9, substitute the appropriate straight-thru cable.

Telnet Cabling

A telnet login requires that there be an Ethernet cable attached to the Magnum Router's E1 (or Ethernet) port and that the PC can gain IP access to the Magnum Router.

Attach the supplied Ethernet cable (M5000C/CAT5E) Category-5 (or equivalent) cable from the E1 port to an Ethernet hub or switch. If the PC is to be directly attached to the Magnum Router, then an Ethernet crossover cable will be required.

A Successful connection can be visually verified, as the green link light on the Magnum Router's Ethernet port will be lit.

Before attempting to logon to the Magnum Router, verify that the PC that is running the Magnum Router Manager can access the Magnum Router by performing a **PING** command.

The default IP address of the 10/100 Base-T E1 port is 10.1.100.250 with a subnet mask of 255.255.255.0.

Marathon Matrix Cabling

It is possible to connect to a Magnum Router through a Marathon Async port either by direct cable connection or by modem connection.

In order to perform a Marathon Matrix connection, there must be 2 available Async ports on the Marathon base unit. Further, this will require 2 cables. If the connection is to be a direct connection, then the M5000C/CP cable and the M5000C/MATRIX cables will be required. If the connection is to be via a modem connection, then the M5000C/MODEM cable will connect the modem to the Marathon Async port and the M5000C/MATRIX cable will be required to connect the second Marathon Async port to the Magnum Router Console port.

This example assumes a direct connection from the PC to a Marathon.

It is very important that the Marathon Async channel that is to be used is configured properly. Refer to chapter 12 for further information.

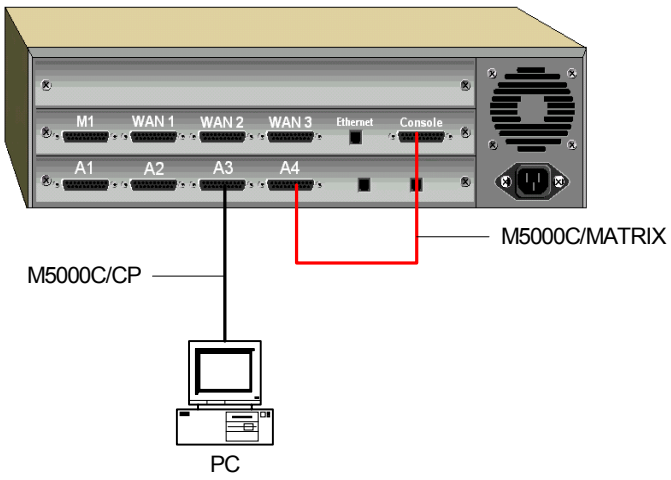
First, attach the DB-9 to DB-25 console cable (included) from an available port of the Marathon base unit to the PC that is running the Magnum Router Manager software.

Logon to the Marathon's Command Facility menu and program a second Async port of the Marathon unit as described in chapter 12.

Once the port has been programmed, logoff the Marathon and close the terminal session used to access the Marathon.

Connect the M5000C/MATRIX cable (included) from the second programmed Async port (done in the previous step) to the console port of the Magnum Router.

An example of cabling is shown below:



Modem Connection Cabling

To connect a Modem to the Magnum Router, some preparation is required to ensure that the Modem and the Magnum Router communicate properly.

The external modem must be a Hayes compatible type (responds to the AT command set) in order for a modem connection to be established.

First, attach a cable from a PC or a dumb terminal to the modem.

If using a PC, start a terminal program. Any terminal program such as Hyperterminal or the terminal program of the Magnum Router Manager will perform the task.

Set the baud rate of the terminal program to 9600, the stop bits to 1, parity to none, and the bit size to 8 (more commonly know as 9600,n,8,1).

Type in **AT** and press enter, the modem should respond with **OK**

Type **AT&F&W** and press **Enter**. The modem should respond with **OK**.

If it fails to respond, check the cable connection and check the modem to see if dipswitch settings need to be changed. Consult the modem manual or vendor if necessary for assistance.

Type the command string **AT&D2&S1&C1&K0Q1E1S0=1&W** and press **Enter**.

Below is a definition of the AT commands that is recommended:

&D2 Modem hangs up call if DTR drops
&S1 Modem drops DSR if carrier is lost
&C1 Modem drops DCD if carrier is lost
&K0 Modem flow control disabled _
Q1 Modem will not send result codes
E1 Modem will echo when in command state
S0=1 Modem will answer after 1 ring
&W Modem configuration is retained even if the modem loses power.

If your modem uses a different command for this function, you will need to substitute the appropriate command in its place.

After completing the above steps, disconnect the PC or dumb terminal from the modem and then connect the supplied DB-25 Male-to-Male cable (M5000C/MODEM) from the console port of the Magnum Router to the external Modem.

This same command string will work if a Marathon Matrix connection is to be used in conjunction with modem access to a Magnum Router, although a second modem cable will be required to connect the Marathon base unit to the console port of the Magnum Router.

This completes the initial cabling of the Magnum Router. The next section covers the actual login process.

Magnum Router Login Screen

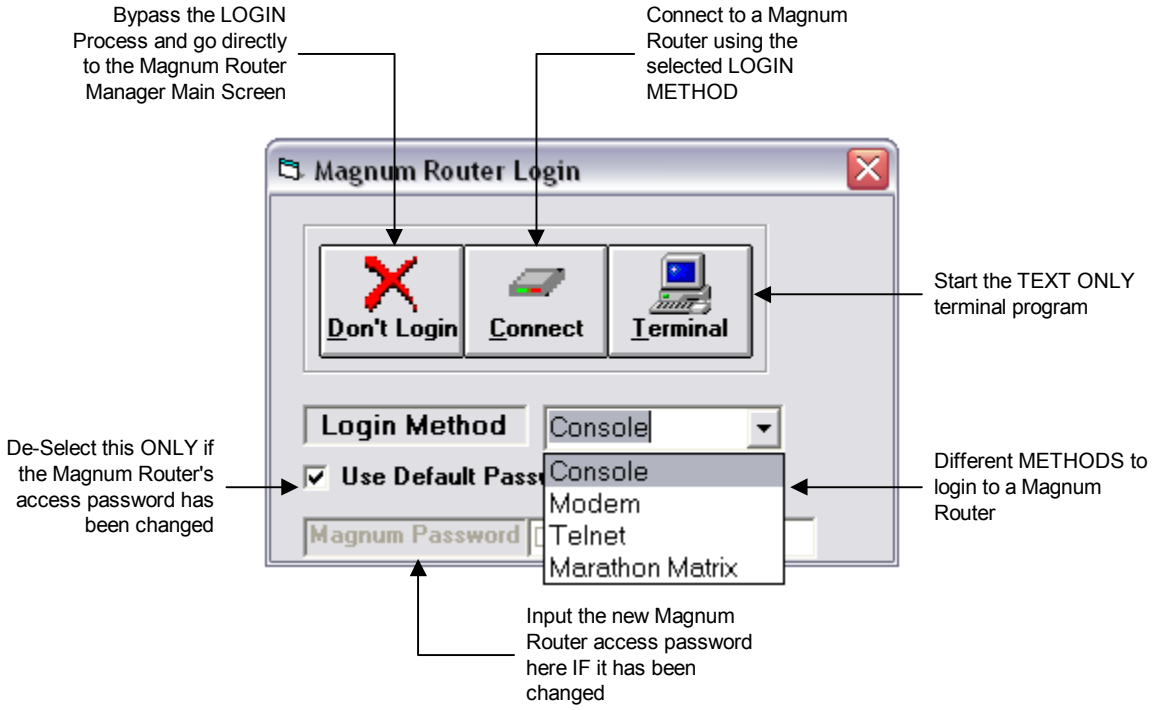

Bypass the LOGIN Process and go directly to the Magnum Router Manager Main Screen
Connect to a Magnum Router using the selected LOGIN METHOD
Magnum Router Login
Don't Login
Connect
Terminal
Start the TEXT ONLY terminal program
Login Method
Console
De-Select this ONLY if the Magnum Router's access password has been changed
Use Default Pass
Console
Modem
Telnet
Marathon Matrix
Different METHODS to login to a Magnum Router
Magnum Password
Input the new Magnum Router access password here IF it has been changed

Figure 8 - Main Login Screen

The Magnum Router Login methods allow access to the Magnum Router via Console Port, Dial Modem, Telnet or Marathon Matrix (by Marathon Node/Channel).

Logging into a Magnum Router is not required to input a configuration. However, several functions of the Magnum Router Manager only function when logged in. Some of these functions are:

- Send Configuration
- Reboot Router
- The *System* menu option
- The *Statistics* menu option

Begin the login process by selecting the desired ***Login Method***. By default ***Console*** connection is selected. To change to another method, click on the dropdown box next to the ***Login Method*** label.

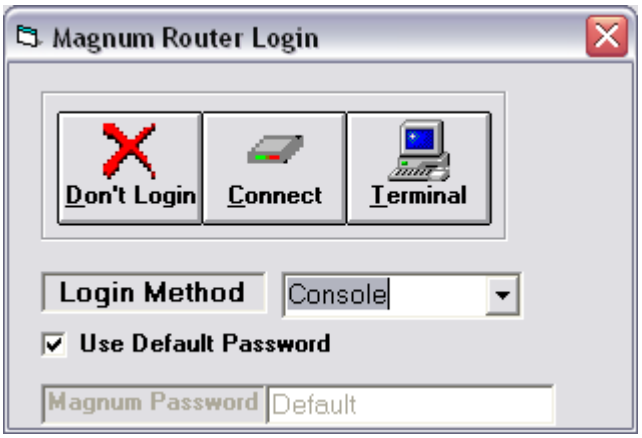
Login Methods

There are 4 different ways to connect to a Magnum Router using the Magnum Router Manager. These ***Login Methods*** are covered below and in subsequent chapters through out the users guide.

Console Login

The default for logging onto a Magnum Router is a serial connection from the PC that is running the Magnum Router Manager software to a Magnum Router card. The connection is accomplished by connecting either the supplied DB-9 to DB-25 straight thru cable (or equivalent) from the PC to the Magnum.

The settings for serial communication with a Magnum Router is 9600 Baud, 8 bits, No Parity and 1 stop bit (commonly referred to as 9600,n,8,1) and cannot be changed.



As can be seen in the above screen, ***Console*** is already selected as the ***Login Method***. Click on the ***Connect*** button to begin the login process.

Telnet

This allows Ethernet access to the Magnum Router. Selecting this option will show an additional section to the main login screen.

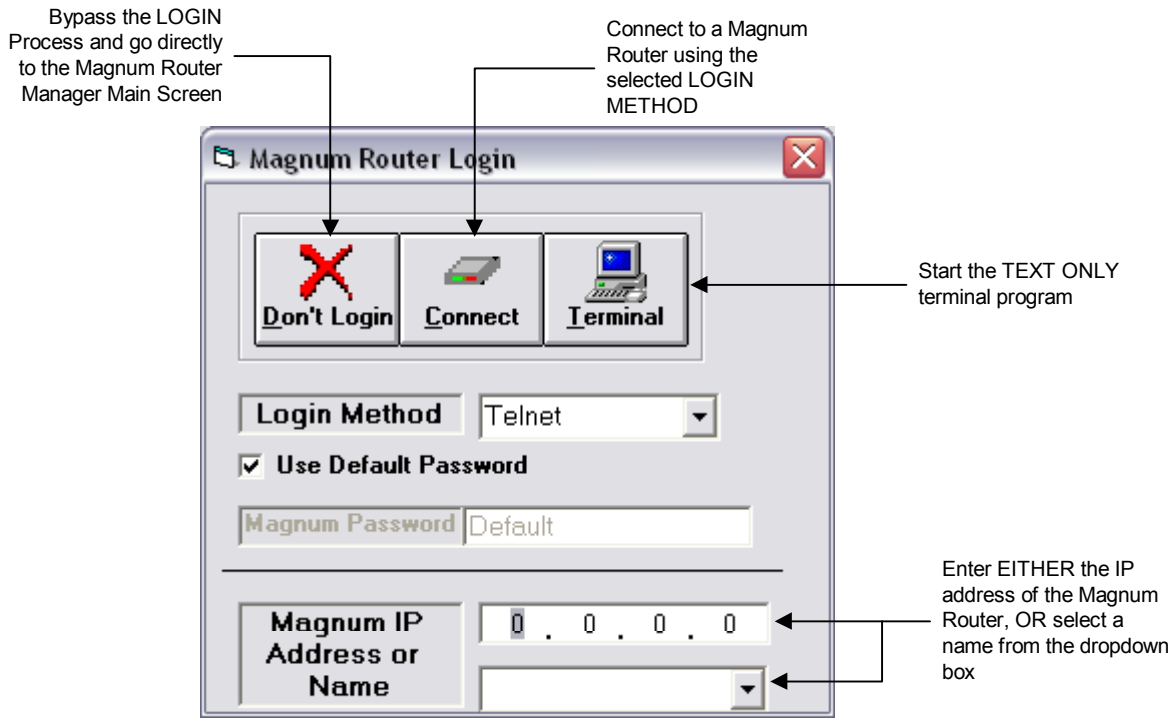

Bypass the LOGIN Process and go directly to the Magnum Router Manager Main Screen
Connect to a Magnum Router using the selected LOGIN METHOD
Magnum Router Login
Don't Login
Connect
Terminal
Start the TEXT ONLY terminal program
Login Method
Telnet
Use Default Password
Magnum Password
Default
Magnum IP Address or Name
0 . 0 . 0 . 0
Enter EITHER the IP address of the Magnum Router, OR select a name from the dropdown box

Figure 9 - Telnet Login Screen

Login by typing in the IP address of the Ethernet port of the Magnum Router, or select a Router Name and the IP address will be automatically filled in.

Router Names are covered in more detail in chapter 7.

The default IP address of the 10/100 Base-T E1 port is 10.1.100.250 with a subnet mask of 255.255.255.0 and the WAN IP address is 192.168.1.1 with a subnet of 255.255.255.0

Micom Marathon Matrix

This gives the ability to connect to the Magnum Router's console port via a Micom Marathon matrix connection. This connection is done by a NODE/CHANNEL connection type.

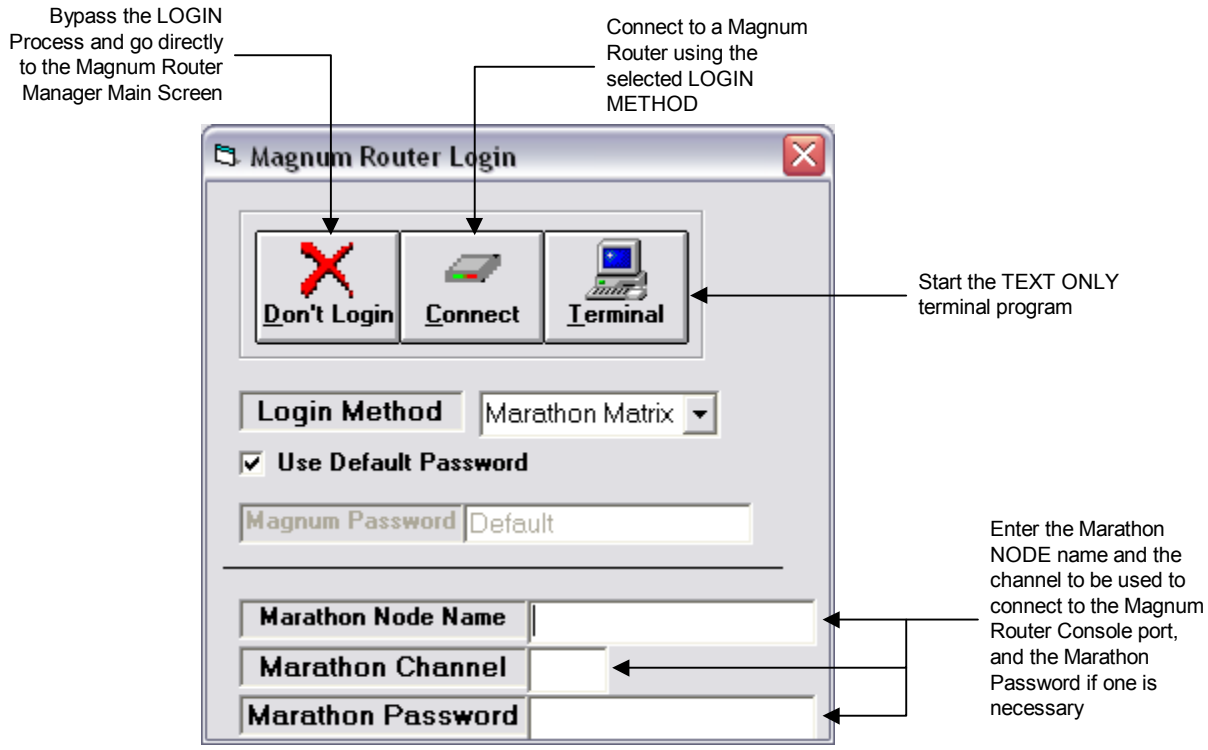
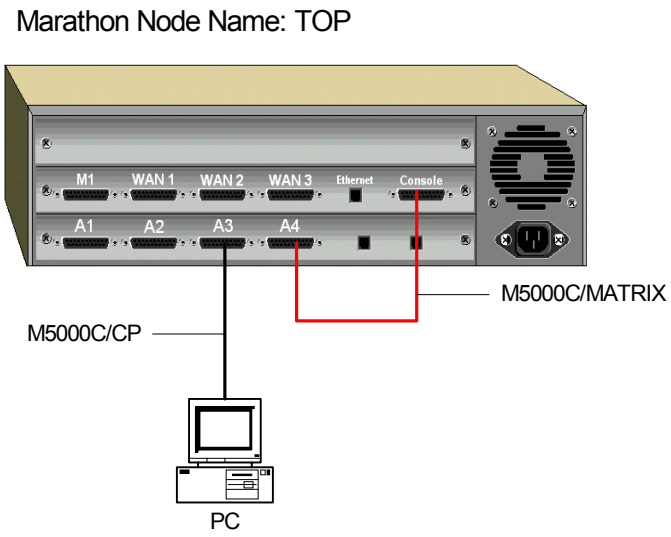

Bypass the LOGIN Process and go directly to the Magnum Router Manager Main Screen
Connect to a Magnum Router using the selected LOGIN METHOD
Magnum Router Login
Don't Login
Connect
Terminal
Start the TEXT ONLY terminal program
Login Method
Marathon Matrix
Use Default Password
Magnum Password
Default
Marathon Node Name
Marathon Channel
Marathon Password
Enter the Marathon NODE name and the channel to be used to connect to the Magnum Router Console port, and the Marathon Password if one is necessary

Figure 10 - Micom Marathon Matrix Login Screen

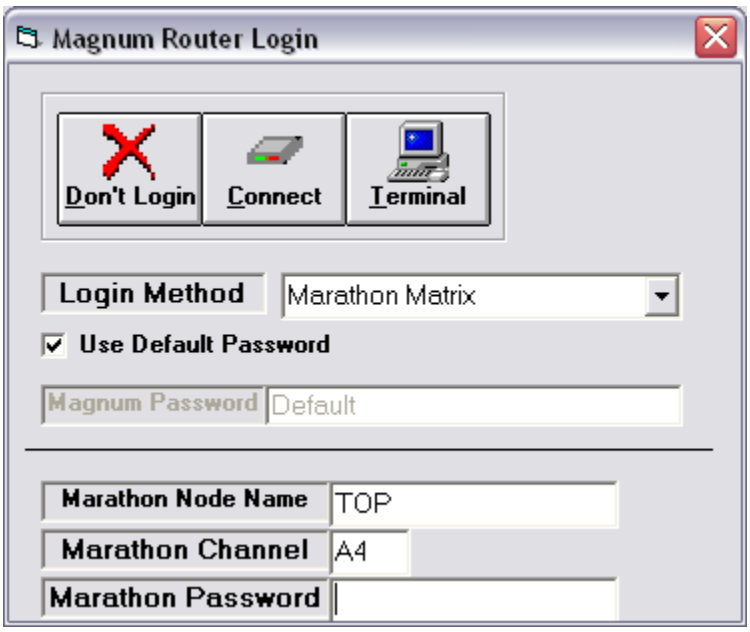
Enter the Micom Marathon node name and channel that is to be used to connect from the Marathon to the Magnum and then click on ***Connect***.

It is very important that the Marathon Async channel that is to be used is configured properly. Refer to chapter 12 for further information.

Below is an example of connecting a PC to the Marathon unit, and connecting the Marathon unit to the Magnum Router.



To use a login method of Marathon Matrix for the above example, fill in the fields as shown below.



This causes the PC (attached to the Marathon A3 port) to connect to the Marathon A4 port that is cabled to the Magnum Router's console port.

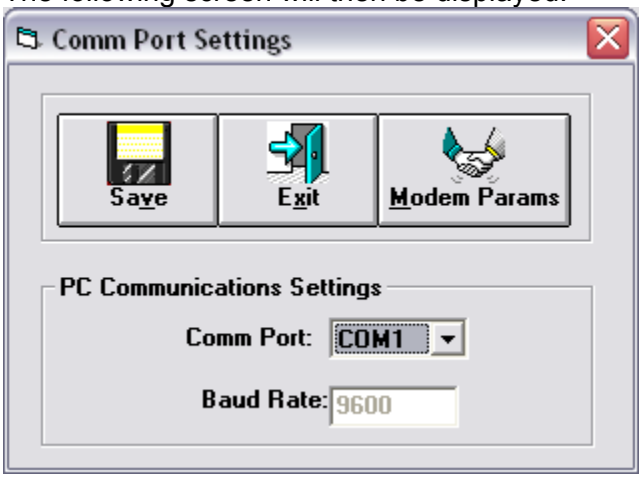
This way, a single connection is capable of controlling both the Magnum Router and the Marathon DVI unit.

Modem

By default, the Magnum Router manager does not send any command strings to the attached modem. In some cases, it is necessary to send special commands to the PC's modem in order to make it work properly. The Magnum Router Manager has the ability to send up to 5 of these special commands.

Special modem commands can be accessed from the ***Modem Parameters*** button of the ***Communications Settings*** screen. The communications settings screen is located in the ***Settings*** menu, ***Communications Settings*** menu item.

The following screen will then be displayed.



Select ***Modem Params*** or press ALT-M and the following screen will be displayed:

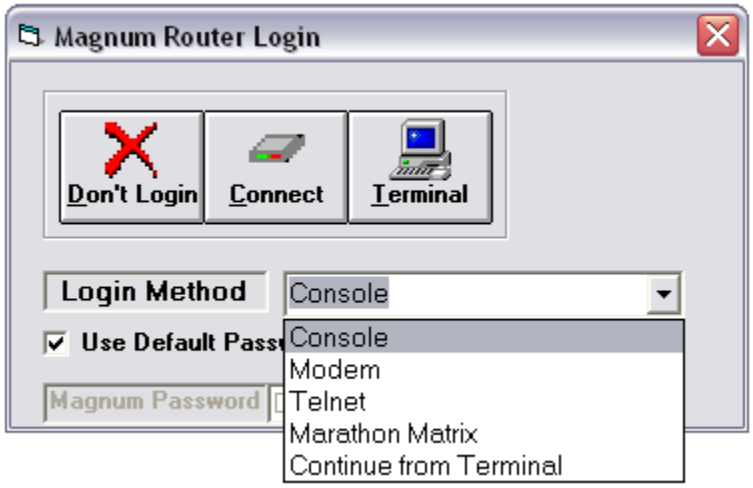
Enter the commands required and click on ***Save*** to save these settings, and then click on ***Exit*** to return to the ***Communications Settings*** screen.

From this point on, the Magnum Router Manager will send the entered commands before dialing the selected number.

If there is a modem change on the PC that is running the Magnum Router Manager, then these commands may be changed or deleted.

Dialing to a Magnum Router

Start the Magnum Router Manager and select ***Modem*** in the ***Login Method*** box.



After selecting ***Modem***, click on the ***Connect*** button. The Phone Directory screen will then be displayed.

Magnum Router Manager Phone Directory

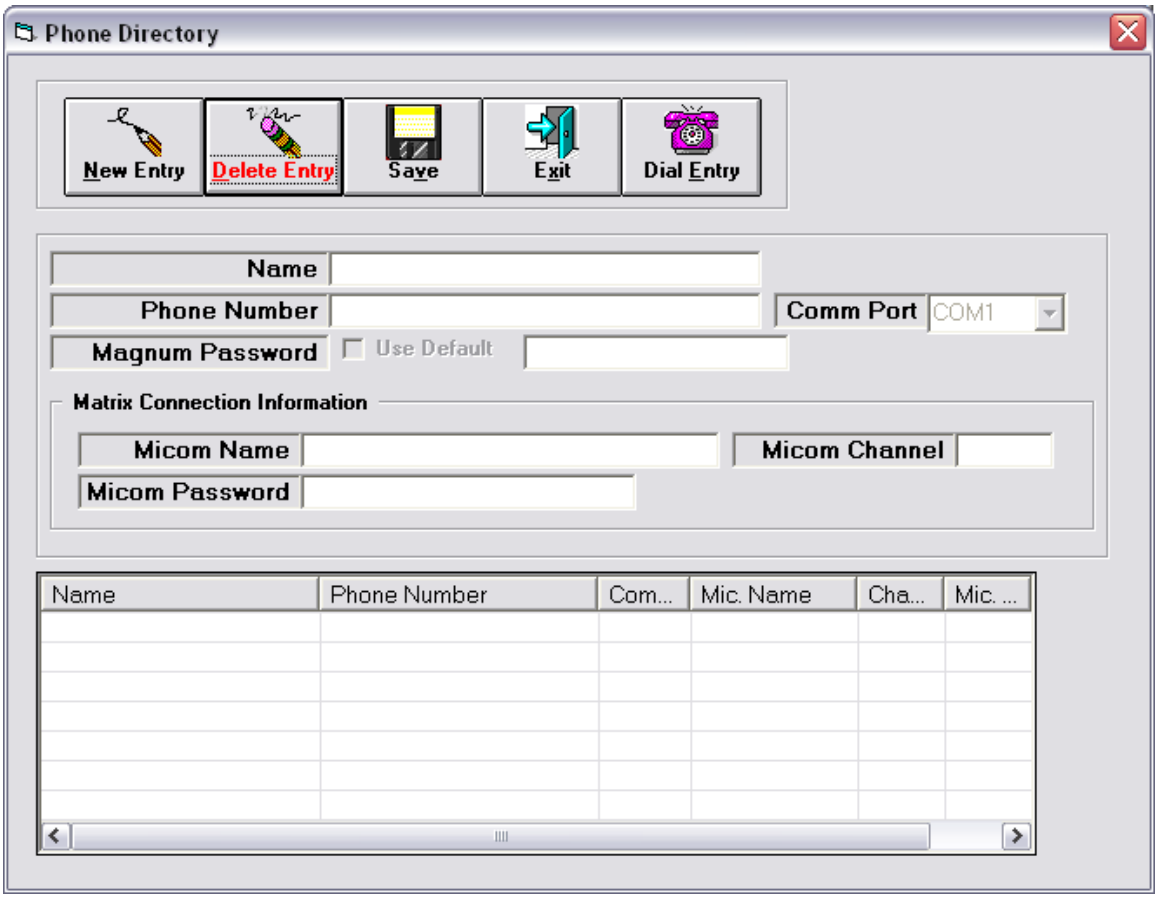


Figure 11 - Magnum Router Phone Directory Screen

All information entered in the Phone Directory is independent from the other settings of the Magnum Router Manager. Meaning that the COM port selected in the Phone Directory can be the same or different from the one selected in the Communications Settings screen.

Adding Entries in the Phone Directory

To add an entry in the Phone Directory, perform the following steps:

1. Click on ***New Entry*** or press ATL-N
2. Fill in the fields on the screen
3. Click ***Save Edit*** or press ALT-V
4. Click ***Exit Edit*** or press ALT-X

Changing a Phone Directory Entry
It is possible to change an entry after it has been entered into the table. Follow these steps to change an entry:

1. Double-Click on the entry that needs modification in the table
   This will cause all of the entry data to be loaded in the fields above the table.
2. Make any modifications required
3. Click on ***Save Edit*** or press ALT-V
4. Clock on ***Exit Edit*** or press ALT-X

If this entry was selected by mistake and is not the one that needed modification, just click on the ***Exit Edit*** or press ALT-X.

Deleting Phone Directory Entries
In some cases, an entry may need to be deleted. To do this, follow these steps:

1. Select an entry in the table.
2. Click the ***Delete Entry*** button or press ALT-D.
3. A verification question is asked to make sure that this is the entry to delete, if it is, select yes.

Repeat for each entry that is to be deleted.

Dialing a Magnum Router
After entering data in the Phone Directory screen (make sure to save any entries so they will not be lost), select the entry desired and click on the ***Dial*** button.

After clicking on the ***Dial*** button, the following screen will appear:

Upon a successful connection, the Magnum Router Manager's status will change and reflect that there is a MODEM connection as shown below.

If an error occurs during the modem connection, an error message will appear.
One possible error is shown below.

Terminating a Dial Up
Terminating a modem connection to a Magnum Router can be accomplished in 2 ways.

(1) Exit the Manager.
(2) From the ***Access*** Menu, select ***Logoff the Magnum Router***.
Selecting ***Logoff the Magnum Router*** will prompt if the modem is to be disconnected.

If the modem is left in an on-line state, it can be disconnected at a later time by selecting ***Hang-Up Modem*** from the ***Access*** menu.

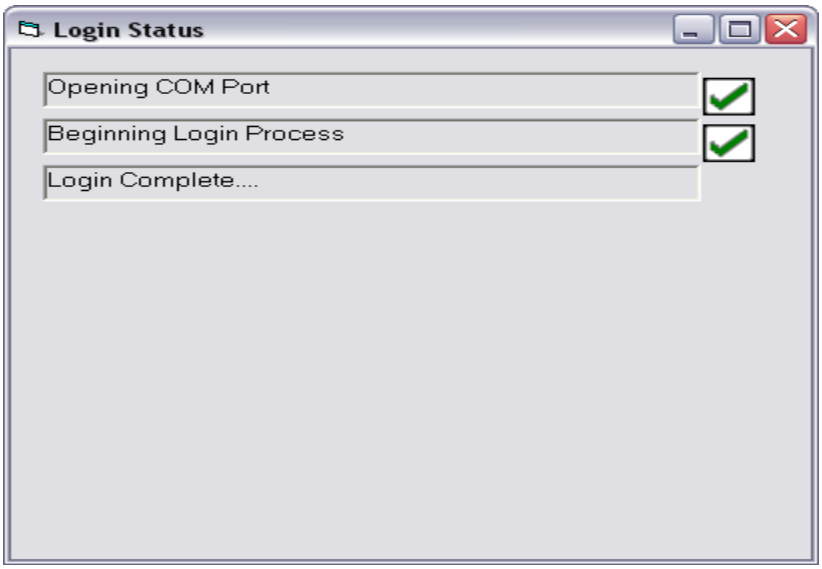
Passwords

On the main login screen, there are places for passwords. The first is for the Magnum Router access password. If there have been no changes to the passwords of the Magnum Router, leave the ***Use Default Password*** checked, however, if the access password has been changed, remove the check next to the default password box, and enter the access password. The Magnum Router access password change is covered later in this section.

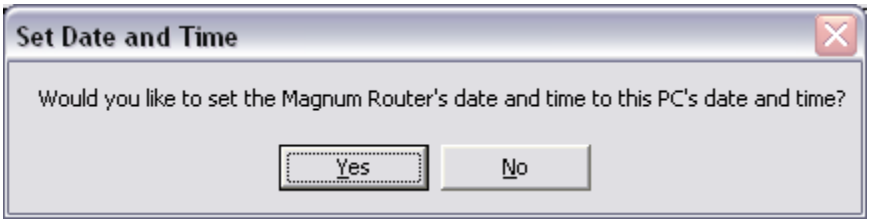
The second is for the Micom Marathon Matrix connection. If the Marathon that is being used has no password, leave this space blank.

Login Messages

After selecting the desired login method, select connect by either clicking on ***Connect***, or pressing ALT-C. If ***Modem*** was selected, the dialing directory will appear (see above), but if any other method was selected, the status screen will be displayed.



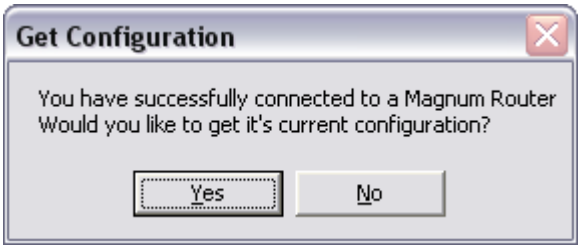
This screen is for informational purposes, just to show the status of the login process.
Once the basic login process has completed, the following question will be asked:



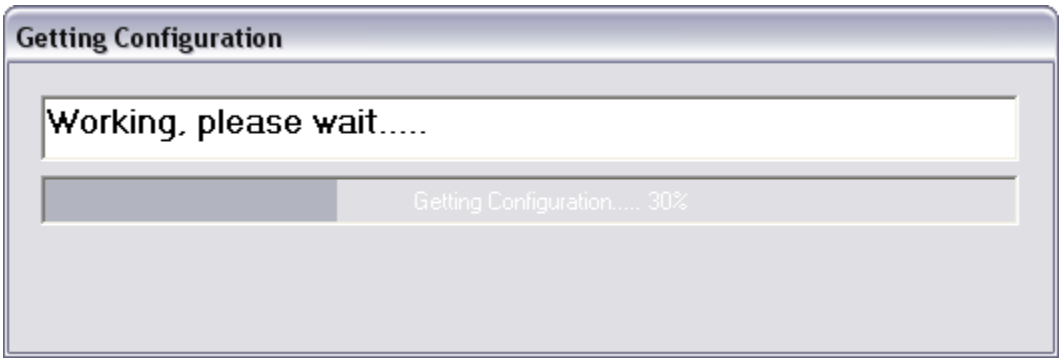
The Magnum Router does support a real-time clock. This option is just to set the date and time on the Magnum Router. This can be helpful for problem diagnostics. It is NOT required.

Get Configuration

After the "Set Date/Time" question, the Magnum Router Manager will inquire about getting the current configuration from the Magnum Router that has just been logged into. If this is new installation, click ***No***. If the configuration of the connected Magnum Router requires viewing or modification, then select ***Yes***


Get Configuration
You have successfully connected to a Magnum Router
Would you like to get it's current configuration?
Yes
No

If ***Yes*** was selected, the following screen will appear, reporting that the manager is getting the connected Magnum Router's stored configuration.



Other Login Screen Options

There are 2 other buttons on the login screen.

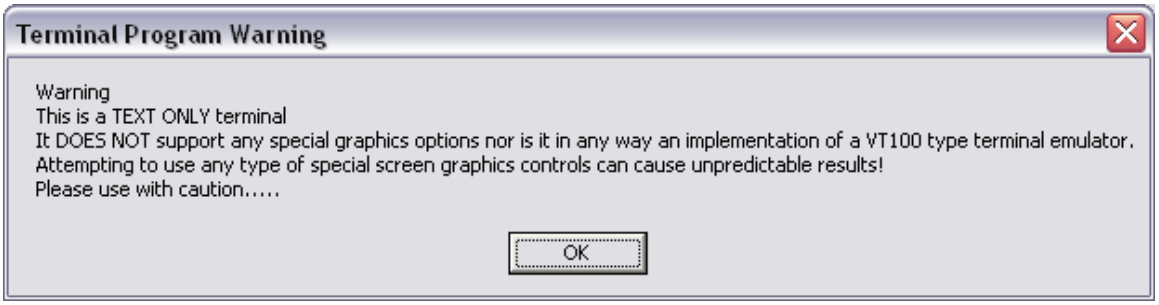
Select this button by either clicking on it, or pressing ALT-D. This will bypass the login process and will then show the Magnum Router Manager main screen.

Magnum Router Manager Terminal

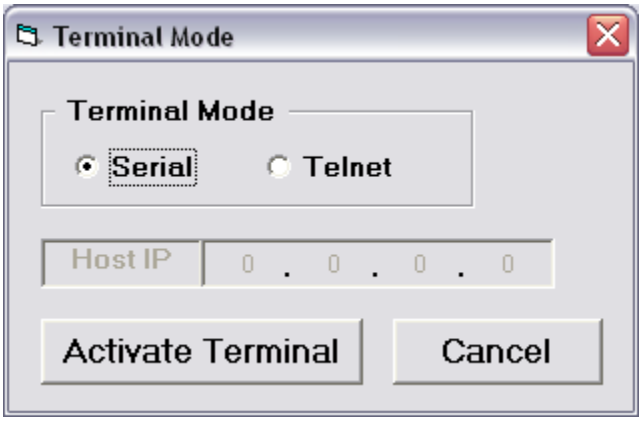
This option opens a text-based terminal. This can be used to program optional equipment (such as a Micom Marathon) without having to exit the Magnum Router Manager. It is NOT a VT100 terminal emulator. This means that special control characters are not recognized and will be displayed. As an example, it could be used to access a Micom Marathon to check the unit status. The terminal program will ONLY work if the Manager IS NOT currently logged onto a Magnum Router.

The terminal can only be accessed through the main login screen.

Clicking on the "Terminal" button will display a cursory warning as to the capabilities of the terminal program.


Terminal Program Warning
Warning
This is a TEXT ONLY terminal
It DOES NOT support any special graphics options nor is it in any way an implementation of a VT100 type terminal emulator.
Attempting to use any type of special screen graphics controls can cause unpredictable results!
Please use with caution.....
OK

Click ***OK*** and the terminal mode screen will be displayed.



Select ***Serial*** if the connection to the device is using the PC's communications port, or select ***Telnet*** and enter a ***Host IP*** address to connect remotely.

Select ***Cancel*** to return to the main login screen.

Selecting ***Activate Terminal*** will display the Magnum Router Manager terminal screen.

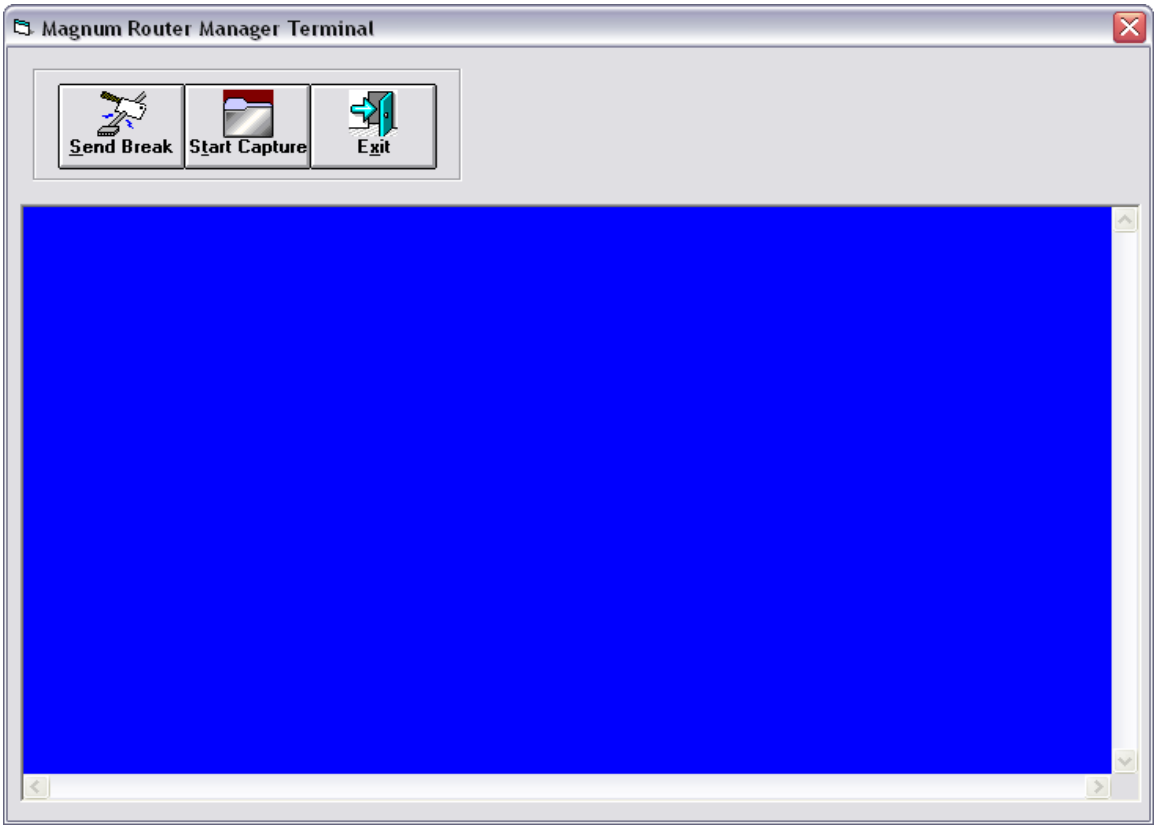


Figure 12 - Magnum Router Manager Terminal Screen

The terminal program has an internal scroll back buffer of 4000 bytes, the ability to capture incoming data to a file and the ability to send a “break” sequence to a device.

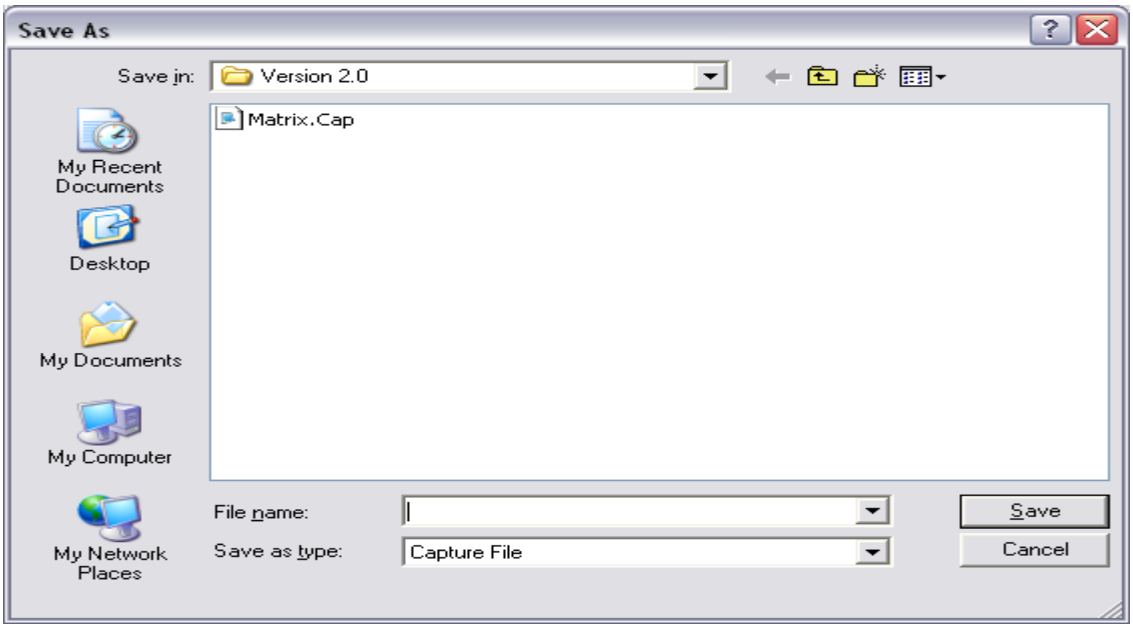
It does NOT include any file transfer capabilities.

Magnum Router Manager Terminal Commands

As seen in the above screen, the terminal has 3 basic commands:

This sends a “break” sequence to the attached device. As an example, it is required to send 3 “break” sequences to terminate a Marathon Matrix connection. Each time this button is clicked, the terminal program will show “Break Sent” in the display when it has completed the task.

This is used for capturing incoming data to a file. Clicking on the “Start Capture” button will display the file save screen.



Enter the file name and click on ***Save***. Once this has been done, the ***Start Capture*** button changes to ***Stop Capture***.

Once the desired data has been captured, click on the ***Stop Capture.***

Select this to close the terminal program and return to the main login screen.

Chapter 7: Magnum Router GUI Manager

The Manager User Interface

The Magnum Router GUI Manager uses a graphical user interface common to most Windows programs. Movement around the manager is done by either clicking the button or menu item, using shortcut keys (as shown by an underscore under a letter or a menu or button), or using the tab key.

Selected buttons change text color from black to red

Throughout the Magnum Router Manager, there are several shortcut keys that have been kept constant, these are:

ALT-V = is used to save changes to edited fields, or save an entire screen of data.
ALT-X = is used to exit editing, or exit a screen to the previous screen
ALT-N = is used to create a new configuration or entry in a screen
ALT-D = is used for deletion of data from a screen

Important Note: Any data that is entered into the Magnum Router Manager is not sent to any Magnum Router until the ***Send Config*** button is selected.

Magnum Router Manager Main Screen

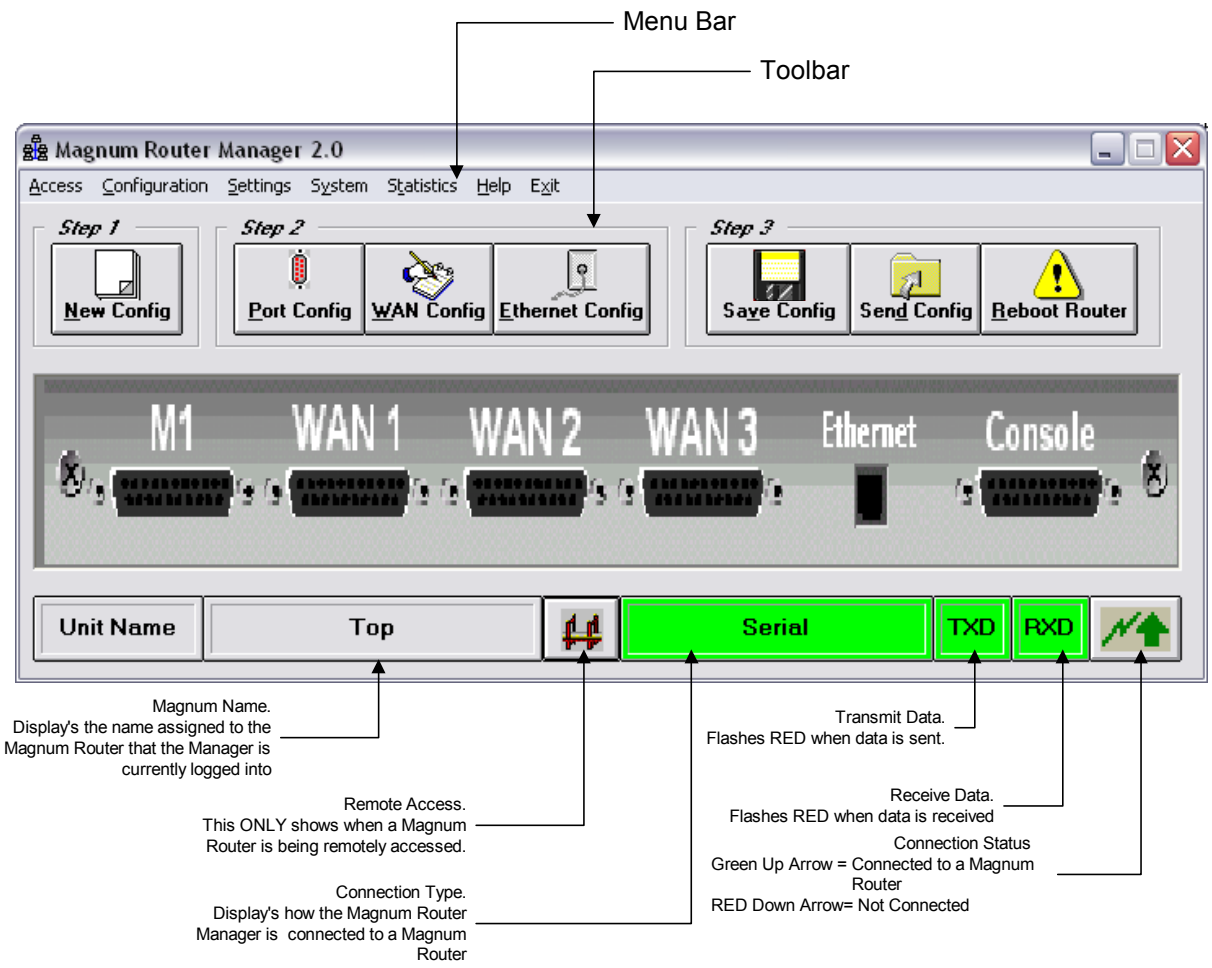


Figure 13 - Magnum Manager Main Screen

The Magnum Router Manager screen is broken into 3 sections. The Menu Bar, the Toolbar and the Status bar. Each of these sections are covered in detail throughout this chapter.

Toolbar Buttons

Figure 14 - Main Screen Toolbar

The Toolbar buttons are displayed below the Menu Bar and consist of seven command buttons, which correspond to the seven primary steps to program the Magnum Router. Each of these buttons can be accessed by clicking on them, using their shortcut key or by selecting the option in the appropriate menu item (as described above).

New Config Button

This button can be accessed by pressing ALT-N, or selecting ***New Configuration*** from the ***Configuration*** menu.

Select this button to create an empty configuration in the Magnum Router Manager customization.

Selecting this item will cause the ***Set Mangum Name*** screen to appear

Figure 15 - Set Magnum Name Screen

This sets the name of the Magnum Router. It is for informational purposes only and IS NOT required data. However, ***New Config*** must be selected to create an empty configuration in the Magnum Router Manager..

After entering the name, click ***Save*** or press ALT-V to save the name. When completed, click on the ***Exit***, or press ALT-X to return to the Magnum Manager main screen.

Port Config Button

Select ***Port Config*** to configure the physical and logical characteristics of the WAN ports of the Magnum Router (the WAN ports are M1, WAN1, WAN2 and WAN3). Physical characteristics determine whether the port is DTE (accepts clock), DCE (supplies clock) and port speed. Logical characteristics include the Frame Relay LMI type and the Frame Relay link type.

To get to the Port Configuration screen from the manager main screen, click the ***Port Config*** button, or press ALT-P. This is also accessible by clicking on the ***Settings*** menu and selecting ***Port Configuration***.

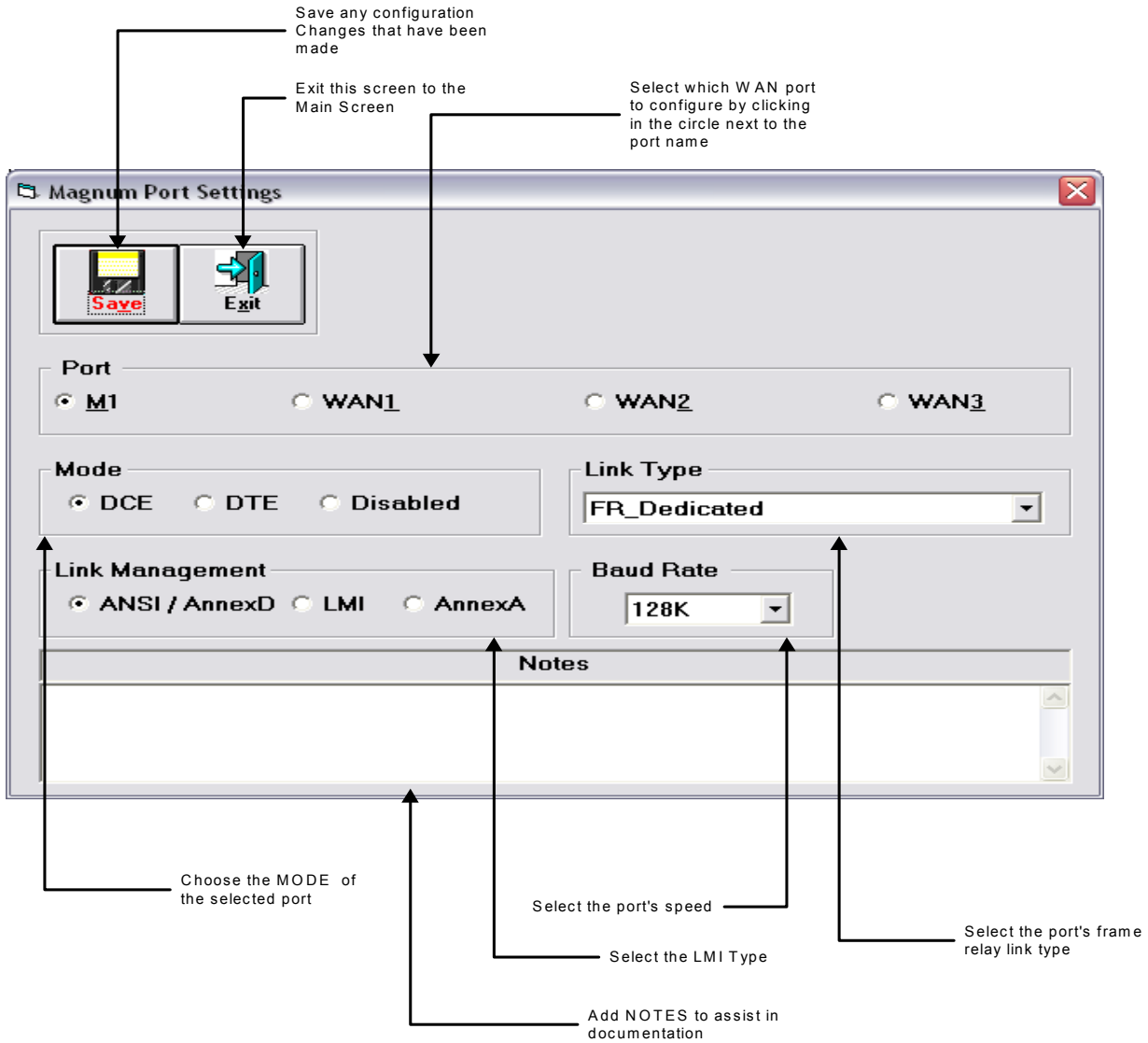


Figure 16 - Port Configuration Screen

Below is a description of the fields on this screen:

Port

Selects the port to be configured.

Mode

Configures the port as physical **DCE** (supplies clock), **DTE** (receives clock), or **Disable** (disables the port altogether). Disable is recommended if the port will not be in use.

Link Type

Specifies the logical interface for the Magnum Router port. Select from the options in the list box. (Link Types are illustrated in Chapter 8). Below is a description of each link type.

FR_PUBLIC

Is used when connecting a Magnum WAN port to a public Frame Relay network.

FR_DEDICATED

Is used when connecting a Magnum Router to a Marathon or another type of Frame Relay Access Device (bridge, Router, FRAD). The Magnum WAN port functions as a frame relay network port when using this setting.

DEDICATED-MASTER

Use when connecting Magnum Router's over dedicated digital data circuits (such as 56K point to point leased lines or T1/E1 or fractional T1/E1 dedicated leased lines). Selecting the DEDICATED-MASTER causes the Magnum Router WAN port to function as a Frame Relay Network Port (supplying LMI and DLCI information to the remote site(s)).

DEDICATED-SLAVE

Use when connecting Magnum Router's over dedicated digital data circuits (such as 56K point-to-point leased lines or T1/E1 or fractional T1/E1 dedicated leased lines). Selecting the DEDICATED-SLAVE causes the Magnum Router WAN port to function as a Frame Relay User Port (accepting LMI and DLCI information from the Magnum Router Master unit).

If installing Magnum Routers on a dedicated (or DDS) circuit, it is important to note that one of the Magnum Routers needs to be set as DEDICATED_MASTER and the other as DEDICATED_SLAVE in order to create a private frame-relay network.

Link Management

Defines the Frame Relay Link Management protocol, either ANSI/Annex D or LMI or Annex A.

Link management protocol is used in all public Frame Relay applications. The Magnum Router WAN port(s) must match the lmi type being provided by the carrier. It is recommended that you request ANSI /Annex_ D for all your frame relay connections.

Baud Rate
Sets the baud rate for the selected port. Choose from the baud rates available in the drop down list box.

Baud Rate Notes

A baud rate denotes the speed of which a serial port is to operate at. The Magnum Router handles baud rates in the following manner:

When the **Port Mode** is selected as **DCE**, then the baud rate selected is the reported clock speed to the attached device. However, if the **Port Mode** is selected as **DTE** (which would accept clock from an external source), the baud rate box changes to a ***Carrier Rate*** box and denotes the accepted clocking speed of an attached device.
The Magnum Router can accept an external clock, but will not report it. Thus, the baud rate selected when the **Port Mode** is **DTE** is for documentation purposes.

However, it is important to note that the **DTE** baud rate is used for calculating the estimated bandwidth used in the ***Port Utilization*** screen.

Notes
The notes field of the Port Settings screen gives a convenient way to document data that is relevant to the selected port, such as circuit ID, or where the port connects to, etc.

Save
Select ***Save*** to save changes to the Magnum Router Manager.

Exit
Select ***Exit*** to close this screen and return to the Magnum Router Manager main screen.

WAN Config Button

Click the ***WAN Config*** button on the Magnum Router Manager main screen, press ALT-W, or select ***WAN Configuration*** from the ***Settings*** menu to access the WAN Configuration screen.

In a frame relay environment, end-points are connected together via the use of PVC's (Permanent Virtual Circuits). The WAN Configuration screen is where these PVC connections are created in the Magnum Router.

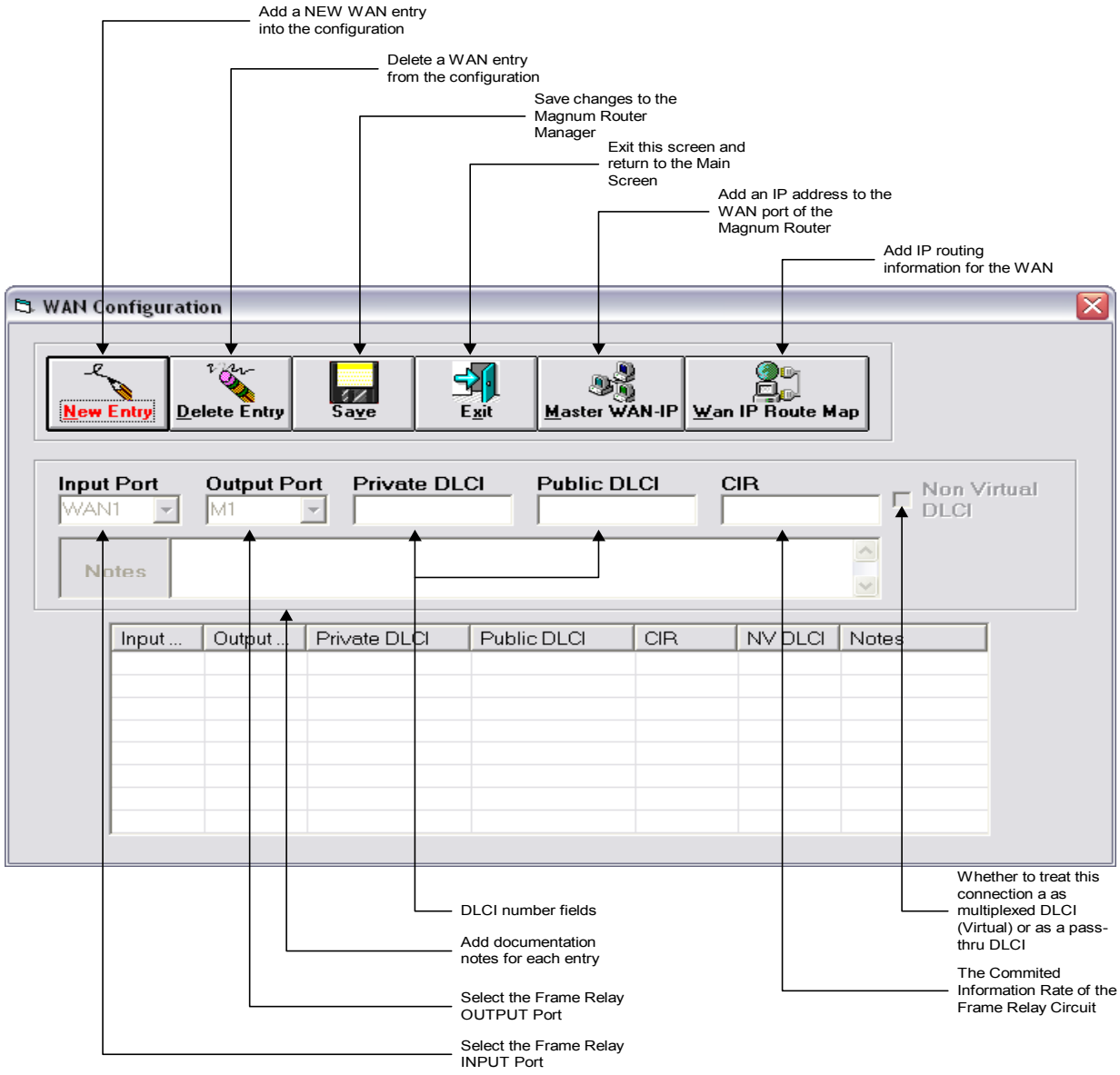


Figure 17 - WAN Configuration Screen

The Input and Output port fields of the WAN Configuration screen define the physical ports of the Magnum Router.

The Private and Public DLCI fields define the DLCI end-points of a PVC. A *PUBLIC* DLCI would (in most cases) be the DLCI that is being supplied by the Frame Relay provider. The *PRIVATE* DLCI is (under normal circumstances) an internal number that is used ONLY by the devices attached to the Magnum Router.

The *CIR* is the Committed Information Rate of the circuit; the Frame Relay provider supplies this.

The *Non Virtual DLCI* checkbox is a special configuration command that is clarified in chapter 8.

Notes allows for a note regarding the entry. Each entry can have it's own note, and each note can be up to 1,024 characters in length.

Adding a WAN Configuration Entry
To add an entry in the Master WAN-IP screen, perform the following steps:

1. Begin by clicking on the ***New Entry*** button, or by pressing ALT-N
2. Select the Input Port from those available in the drop down list box.
3. Select the Output Port from the dropdown box.
4. Enter the Private DLCI
5. Enter the Public DLCI
6. Enter the CIR for this connection
7. Select ***Non Virtual DLCI*** if required.
8. Click on the ***Save Edit***, or press ALT-V to save this entry.
9. Click on the ***Exit Edit***, or press ALT-X to end this entry.

Changing a WAN Configuration Entry

It is possible to change an entry after it has been entered into the table. Follow these steps to change an entry:

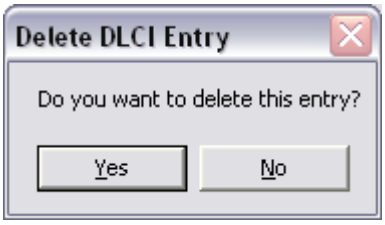
1. Double-Click on the entry that needs modification in the table
2. Make any modifications required
3. Click on ***Save Edit*** or press ALT-V
4. Click on ***Exit Edit*** or press ALT-X

If this entry was selected by mistake and is not the one that needed modification, just click on the ***Exit Edit*** or press ALT-X.

Deleting a WAN Configuration Entry

In some cases, a WAN entry may need to be deleted. To do this, follow these steps:

1. Select an entry in the table.
2. Either click the ***Delete Entry*** button or press ALT-D.
3. A verification question is asked to make sure that this is the entry to delete, if it is, select ***Yes***. Selecting ***No*** will return to the WAN Configuration screen.



Repeat for each entry that is to be deleted.
Once all of the WAN entries have been completed, click on the ***Save*** button or press ALT-V.

Other WAN Config Buttons

There are 2 other options in the WAN Configuration screen; these are the Master WAN-IP Address and the WAN-IP Route Map. These are covered in the following pages.

Master WAN-IP Address

The ***Master WAN-IP*** address screen is only available via the ***WAN Configuration*** screen.

The Magnum Router is a Frame Relay switch and IP router combined into a single product. The Master WAN-IP address screen allows users to configure a single WAN interface or multiple WAN sub-interfaces by mapping and assigning a unique IP network number to specific DLCI's.

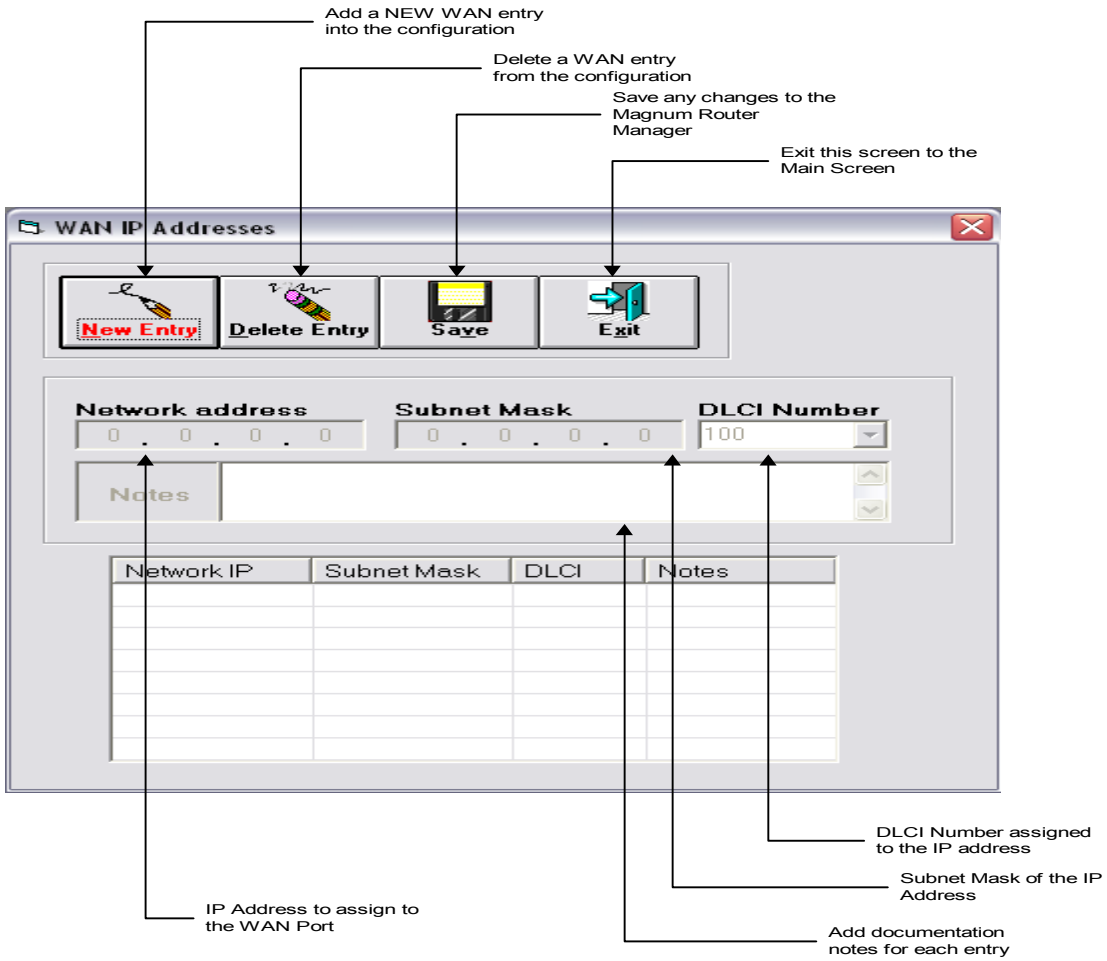


Figure 18 - Master WAN IP Address Screen

It is possible to have 1 primary and up to 253 additional IP addresses in the Master WAN-IP table.

Adding a Master WAN-IP Address Entry

To add an entry in the Master WAN-IP screen, perform the following steps:

1. Click on ***New Entry*** or press ATL-N
2. Type in the Network Address, Subnet Mask and DLCI
3. Click ***Save Edit*** or press ALT-V
4. Click ***Exit Edit*** or press ALT-X

If you have more than one remote site to connect to, program a unique IP network number for each WAN sub-interface and map them to their respective unique DLCI number. (refer to chapter 9, sample 3)

Changing a Master WAN-IP Address Entry

It is possible to change an entry after it has been entered into the table. Follow these steps to change an entry:

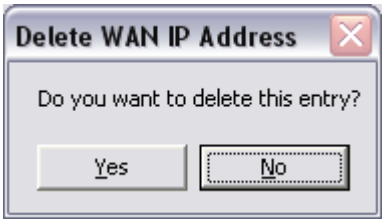
1. Double-Click on the entry that needs modification in the table
2. Make any modifications required
3. Click on ***Save Edit*** or press ALT-V
4. Click on ***Exit Edit*** or press ALT-X

If this entry was selected by mistake and is not the one that needed modification, just click on the ***Exit Edit*** or press ALT-X.

Deleting a Master WAN-IP Entry

In some cases, an entry may need to be deleted. To do this, follow these steps:

1. Select an entry in the table.
2. Either click the ***Delete Entry*** button or press ALT-D.
3. A verification question is asked to make sure that this is the entry to delete, if it is, select ***Yes***. Selecting ***No*** will return to the Master WAN-IP Address screen.



Repeat for each entry that is to be deleted.

WAN-IP Route Map

The ***WAN IP Route Map*** screen is only available via the ***WAN Configuration*** screen.

The next step will be to fill data into the WAN-IP Route Map screen. The purpose of the WAN-IP Route Map is to set the destination network address with its corresponding DLCI number, port number and associated gateway (a.k.a. next hop IP address).

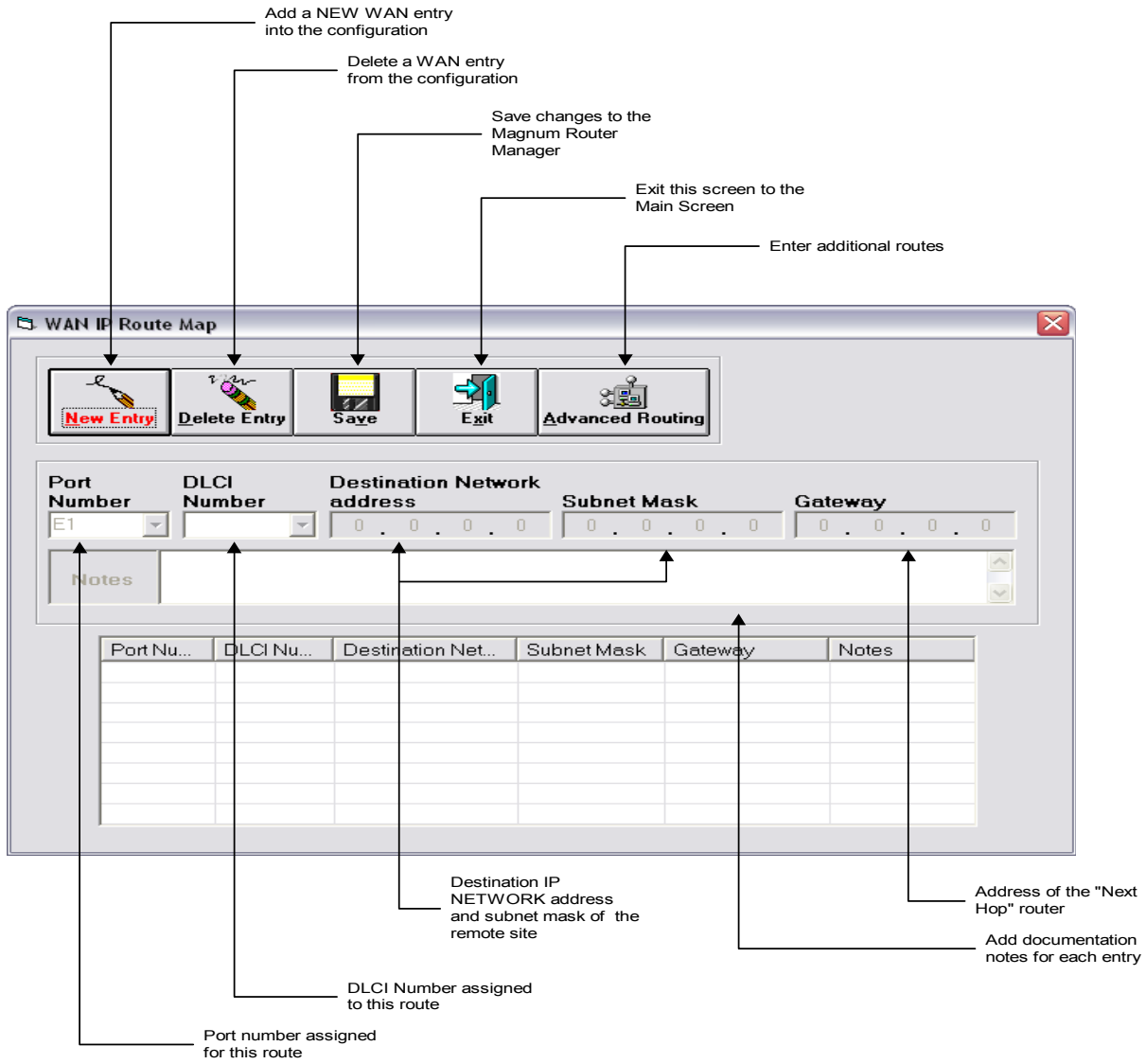


Figure 19 - WAN-IP Route Map Screen

Adding a WAN IP Route Map Entry

To add an entry in the WAN IP Route Map screen, perform the following steps:

1. Click ***New Entry*** and select the Ethernet 1 port
2. Enter the appropriate *private* DLCI number, destination network IP address and subnet mask and corresponding gateway (a.k.a. next hop IP address)
3. Click ***Save Edit*** or press ALT-V to save the entry
4. Click ***Exit Edit*** or press ALT-X to return to the WAN IP Route Map screen.

All entries in the *WAN IP Route Map* are automatically written to the *Advanced Routing* table as well. The *Advanced Routing* section is covered later in this section.

Changing a WAN-IP Route Map Entry

It is possible to change an entry after it has been entered into the table. Follow these steps to change an entry:

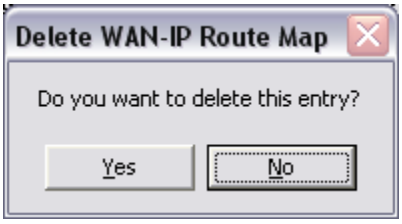
1. Double-Click on the entry that needs modification in the table
   This will cause all of the entry data to be loaded in the fields above the table.
2. Make any modifications required
3. Click on ***Save Edit*** or press ALT-V
4. Click on ***Exit Edit*** or press ALT-X

If this entry was selected by mistake and is not the one that needed modification, just click on the ***Exit Edit*** or press ALT-X.

Deleting a WAN-IP Route Map Entry

In some cases, an entry may need to be deleted. To do this, follow these steps:

1. Select an entry in the table.
2. Either click the ***Delete Entry*** button or press ALT-D.
3. A verification question is asked to make sure that this is the entry to delete, if it is, select ***Yes***. Selecting ***No*** will return to the WAN-IP Route Map screen.



Repeat for each entry that is to be deleted.

If there is no need to add additional routes to the Magnum Router, click on ***Save*** or press ALT-V to save any changes, then click on ***Exit***, or press ALT-X to return to the WAN Configuration screen.

Advanced Routing

This function is only available via the ***WAN-IP Route Map*** screen.

The Advanced Routing section of the Magnum Router Manager allows for additional static routes to be entered. Such routes may include a default route to another router for internet access.

Click on the Advanced Routing button of the WAN IP Route Map screen, or press ALT-A to display the Advanced Routing screen.

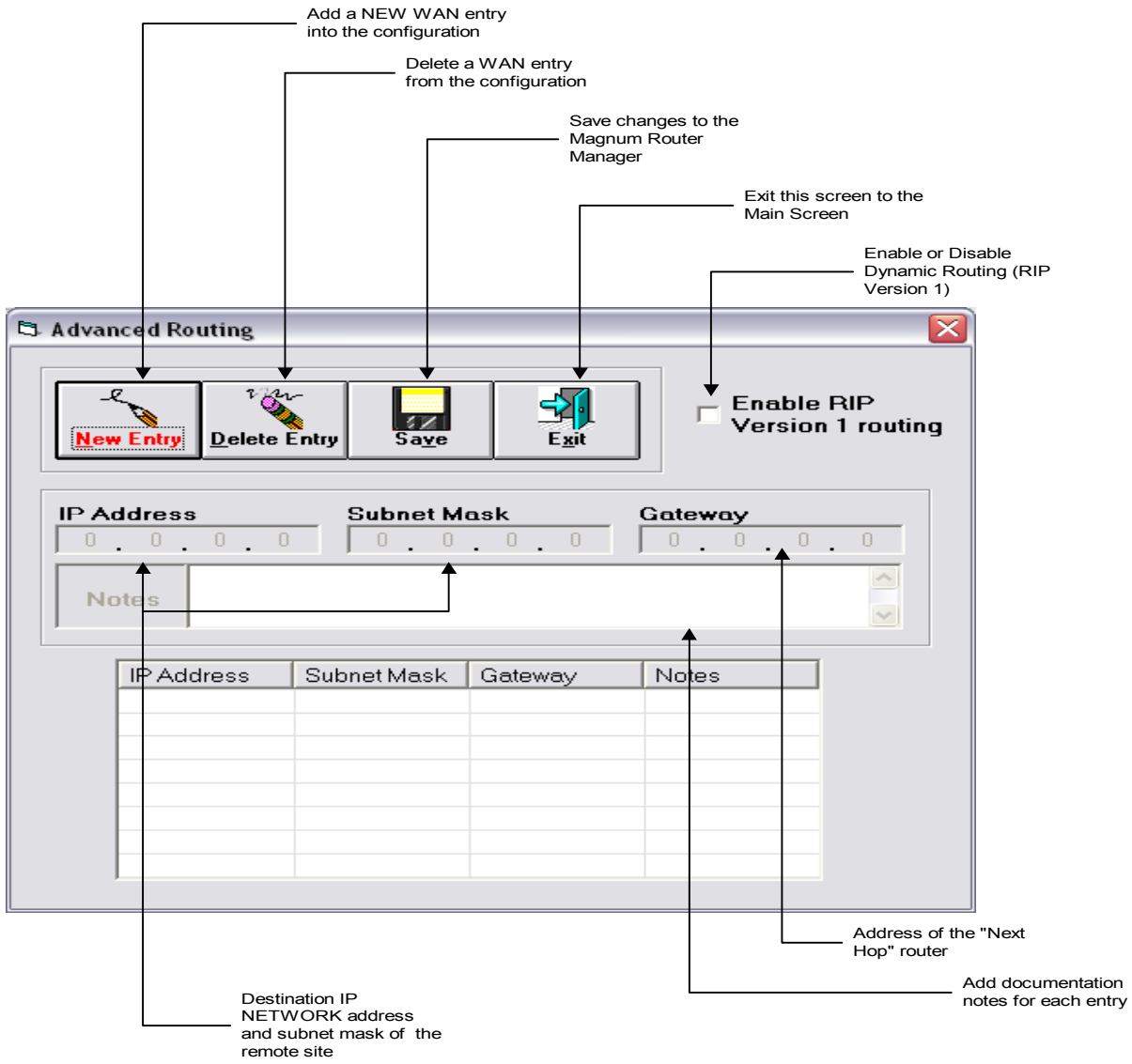


Figure 20 - Advanced Routing Screen

Adding an Advanced Routing Entry

To add an entry in the WAN IP Route Map screen, perform the following steps:

1. Click ***New Entry*** or press ALT-N
2. Enter data in the IP Address, Subnet Mask, and Gateway Address fields
3. Click ***Save Edit*** or press ALT-V to save the entry
4. Click ***Exit Edit*** or press ALT-X to return to the WAN IP Route Map screen.

Changing an Advanced Routing Entry

It is possible to change an entry after it has been entered into the table. Follow these steps to change an entry:

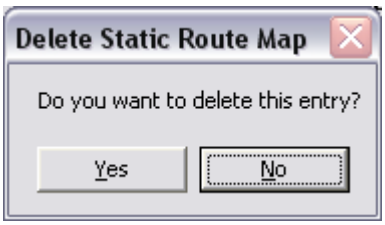
1. Double-Click on the entry that needs modification in the table
   This will cause all of the entry data to be loaded in the fields above the table.
2. Make any modifications required
3. Click on ***Save Edit*** or press ALT-V
4. Click on ***Exit Edit*** or press ALT-X

If this entry was selected by mistake and is not the one that needed modification, just click on the ***Exit Edit*** or press ALT-X.

Deleting an Advanced Routing Entry

In some cases, an entry may need to be deleted. To do this, follow these steps:

1. Select an entry in the table.
2. Either click the ***Delete Entry*** button or press ALT-D.
3. A verification question is asked to make sure that this is the entry to delete, if it is, select ***Yes***. Selecting ***No*** will return to the Advanced Routing screen.



Repeat for each entry that is to be deleted.

Once the additional routes have been added, click on ***Save*** or press ALT-V to save any changes, then click on ***Exit***, or press ALT-X to return to the WAN-IP Route Map screen.

RIP Version 1 Routing

Enable RIP routing by clicking on the box next to ***Enable RIP Version 1 Routing***. To disable RIP routing, remove the check in the box.

The Magnum Router implements the RIP routing protocol in a “hybrid” fashion. It is covered in more detail in chapter 8.

Ethernet Config Button

Select this button to program IP addresses on the Ethernet port of the Magnum Router. This can be accessed by pressing ALT-E, and is also available as ***Ethernet Configuration*** from the ***Settings*** menu.

This section of the Magnum Router Manager allows for the entry of IP addresses on the E1 (Ethernet) port of the Magnum Router.

From the Magnum Router Manager main screen, click on the Ethernet Config button, press ALT-E, or select ***Ethernet Configuration*** from the ***Settings*** menu to display the Ethernet Configuration screen.

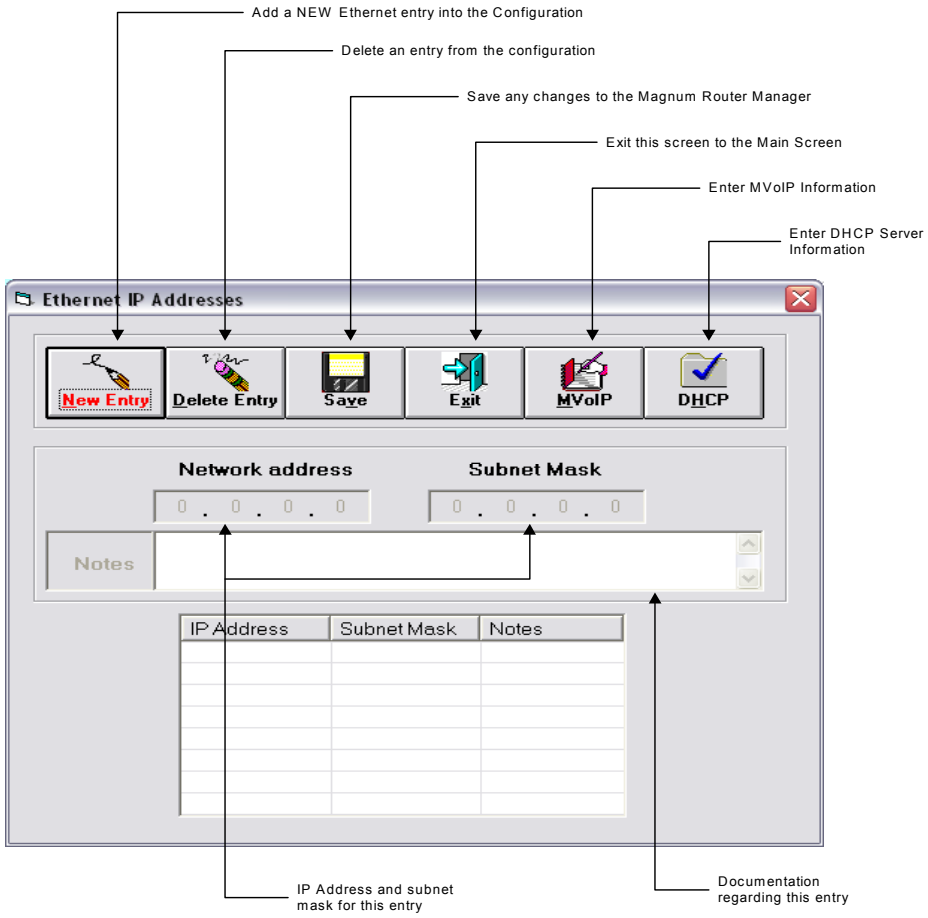


Figure 21 - Ethernet Configuration Screen

It is possible to have 1 primary IP address and up to 253 additional IP addresses on the E1 port.

Adding an Ethernet IP Entry

To add an entry in the Ethernet IP screen, perform the following steps:

1. Click ***New Entry*** or press ALT-N
2. Enter data in the IP Address and Subnet Mask fields
3. Click ***Save Edit*** or press ALT-V
4. Click ***Exit Edit*** or press ALT-X

Changing an Ethernet IP Entry

It is possible to change an entry after it has been entered into the table. Follow these steps to change an entry:

1. Double-Click on the entry that needs modification in the table
   This will cause all of the entry data to be loaded in the fields above the table.
2. Make any modifications required
3. Click on ***Save Edit*** or press ALT-V
4. Clock on ***Exit Edit*** or press ALT-X

If this entry was selected by mistake and is not the one that needed modification, just click on the ***Exit Edit*** or press ALT-X.

Deleting an Ethernet IP Entry

In some cases, an entry may need to be deleted. To do this, follow these steps:

1. Select an entry in the table.
2. Either click the ***Delete Entry*** button or press ALT-D.
3. A verification question is asked to make sure that this is the entry to delete, if it is, select ***Yes***. Selecting ***No*** will return to the Ethernet IP address screen.

Repeat for each entry that is to be deleted.

Micro-Band Voice Over IP

The MVoIP function of the Magnum Router gives the ability to encapsulate any frame relay data that is supplied on any of the WAN ports into a routable IP packet that can be sent over any IP LAN environment (including the Internet).

Before programming any data into the MVoIP screen, certain requirements must be met. These requirements include having to have a WAN Configuration Map entry (See WAN Configuration in this chapter) using a DLCI between 900 and 989 that is mapped from any WAN port to the E1 port, and a WAN-IP Route Map entry for Frame Relay routing that also uses a DLCI that is between 900 and 989. In the Sample chapter there is configuration information that further defines the requirements and just exactly how to program the Magnum Router for MVoIP.

The MVoIP functionality of the Magnum Router is covered in more detail in chapter 8 with programming samples in chapter 9.

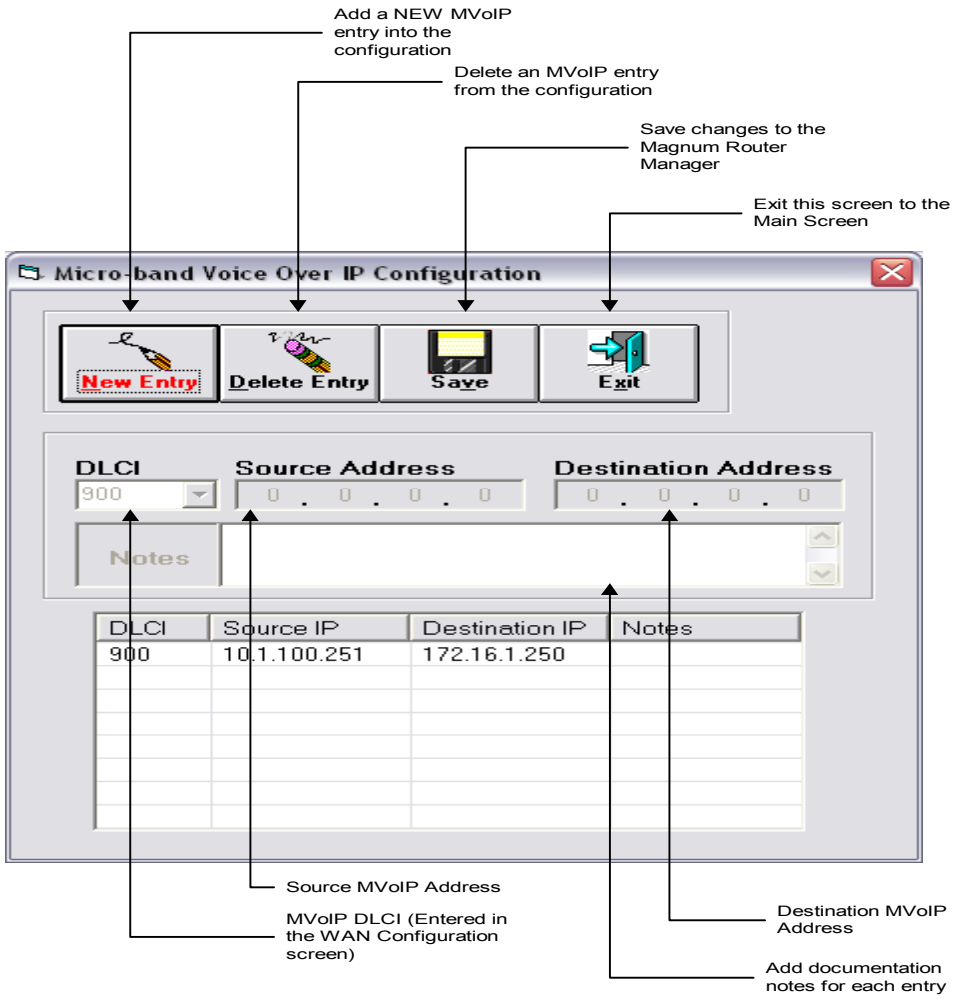
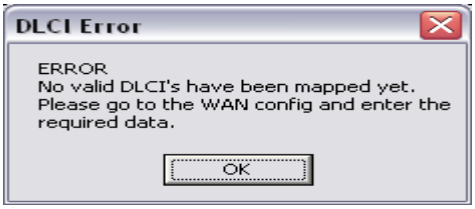


Figure 22 - MVoIP Screen

MVoIP Requirements
The requirements to add an MVoIP entry include an entry in the WAN configuration using a DLCI of 900 thru 989 and an output port of E1; a WAN IP Route Map entry that uses a DLCI from 900 thru 989, and an Ethernet Configuration entry. If any of these requirements are not met, the Magnum Router Manager will report an error if the MVoIP button is clicked. One such error is displayed below:



Adding an MVoIP Entry
To add an entry in the MVoIP screen, perform the following steps:

1. Click ***New Entry*** or press ALT-N
2. Select the MVoIP DLCI from the dropdown box, enter data in the Source IP Address and the destination IP Address
3. Click ***Save Edit*** or press ALT-V
4. Click ***Exit Edit*** or press ALT-X

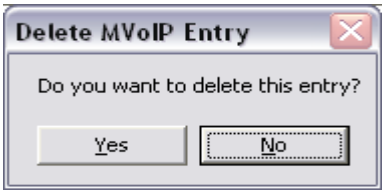
Changing an MVoIP Entry
It is possible to change an entry after it has been entered into the table. Follow these steps to change an entry:

1. Double-Click on the entry that needs modification in the table
   This will cause all of the entry data to be loaded in the fields above the table.
2. Make any modifications required
3. Click on ***Save Edit*** or press ALT-V
4. Clock on ***Exit Edit*** or press ALT-X

If this entry was selected by mistake and is not the one that needed modification, just click on the ***Exit Edit*** or press ALT-X.

Deleting an MVoIP Entry
In some cases, an entry may need to be deleted. To do this, follow these steps:

1. Select an entry in the table.
2. Either click the ***Delete Entry*** button or press ALT-D.
3. A verification question is asked to make sure that this is the entry to delete, if it is, select ***Yes***. Selecting ***No*** will return to the MVoIP screen.



Repeat for each entry that is to be deleted.

DHCP Server

The Magnum Router has the ability to act as a local DHCP server in a network environment. It cannot function as an enterprise level DHCP server, pass DHCP traffic across any of its WAN ports, does not support BOOTP processing and does not support multiple scopes.

Making the Magnum Router the local DHCP server eliminates unneeded WAN traffic while IP hosts make requests for information.

Below is the DHCP Configuration screen:

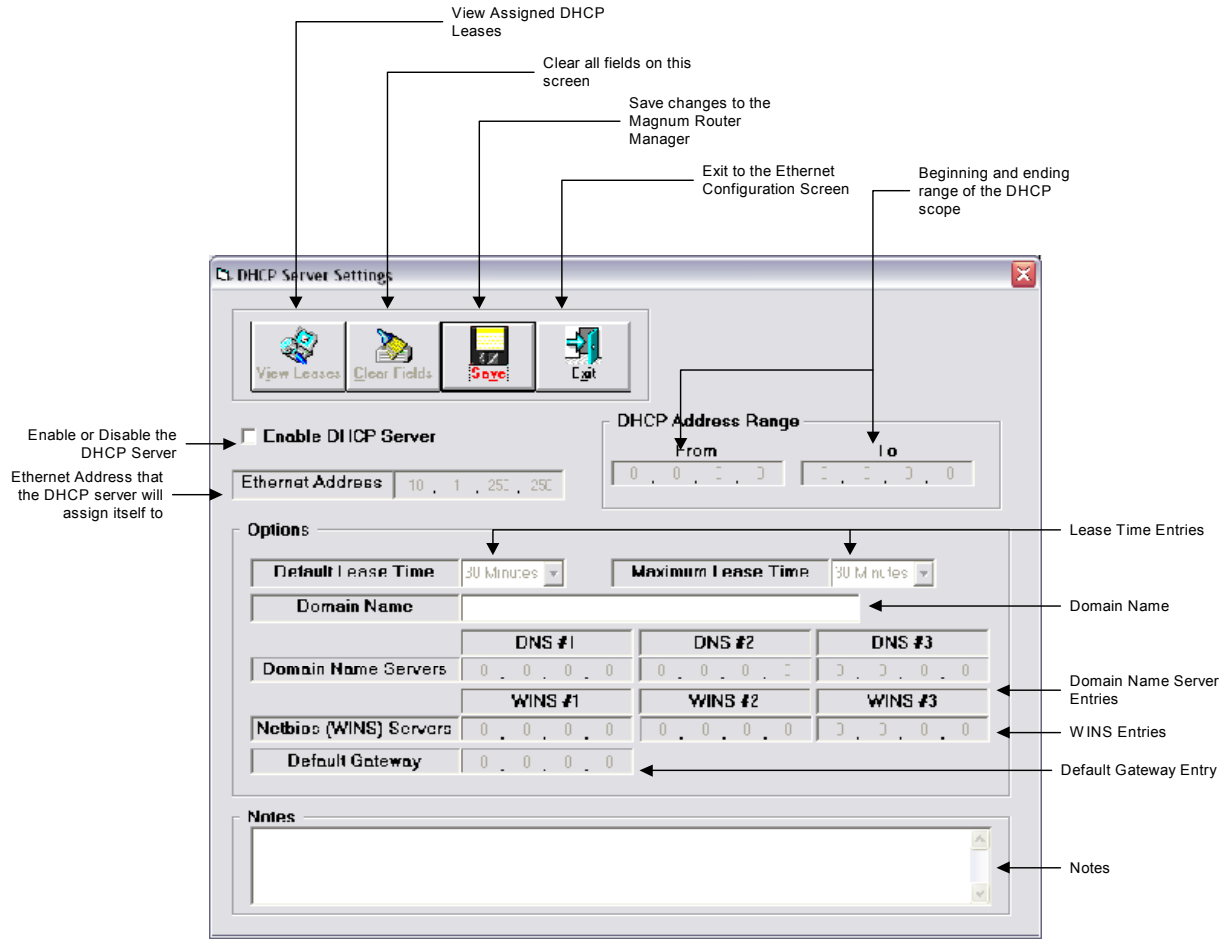


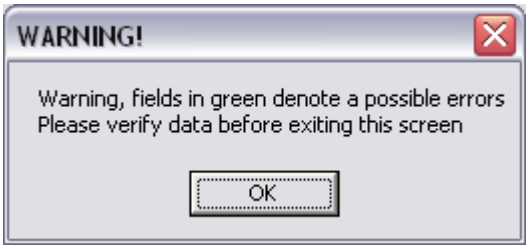
Figure 23 - DHCP Server Screen

Although the Magnum Router is capable of having up to 254 IP address on it's E1 port, only one IP address can be used to support DHCP Server functionality.

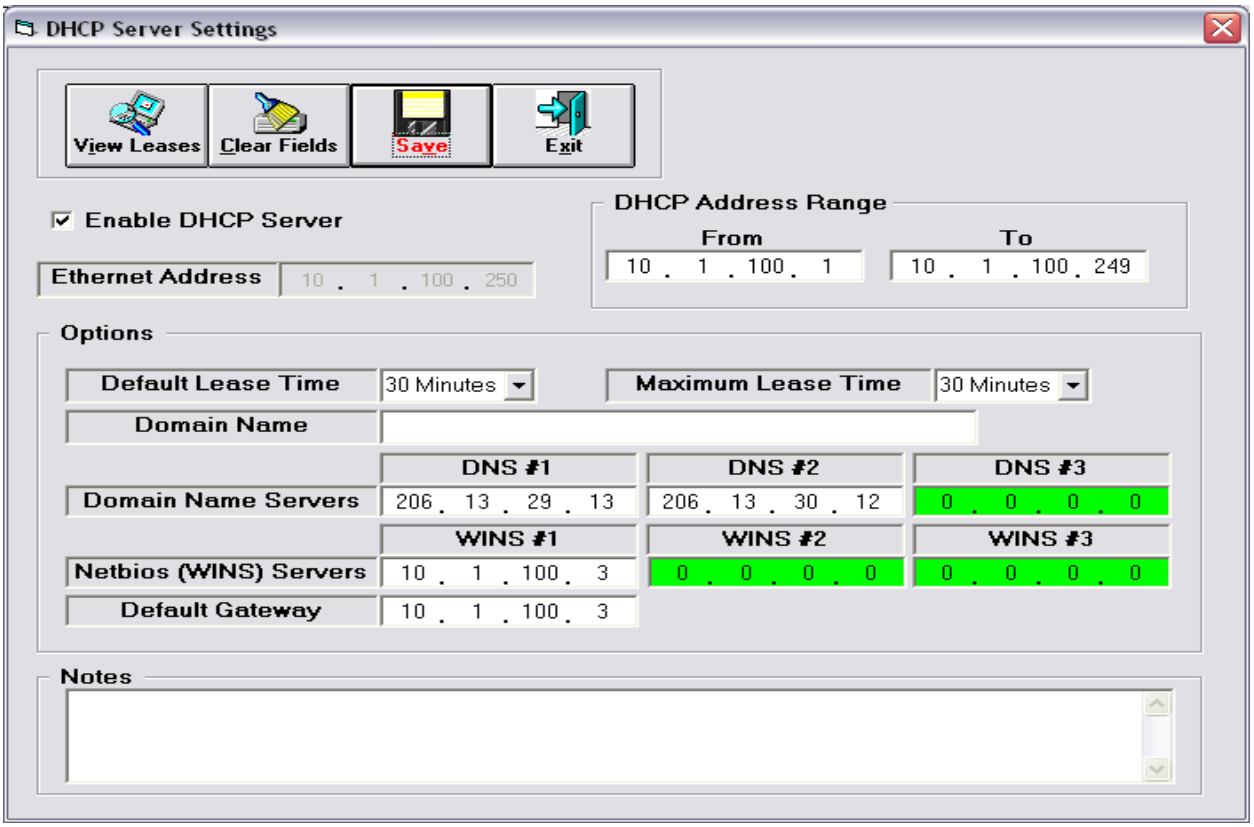
Programming the Magnum Router as a DHCP server, it will supply to the local IP host device such things as an IP address, WINS addresses (up to 3), DNS addresses (up to 3), Domain Name and default gateway information.

Programming the DHCP server requires that an IP address be entered in the Ethernet Configuration screen. Multiple IP addresses can be entered in the Ethernet Configuration screen (up to 254), but only one can be selected to work as the host IP for the DHCP server.

Fill in the appropriate data needed and click on the ***Save*** button to save the entered data. The system does a check on the entered data. The following message might appear:



The fields highlighted in green are not necessarily errors, just warnings that data has not been entered in the field. An example of the highlights is shown below:



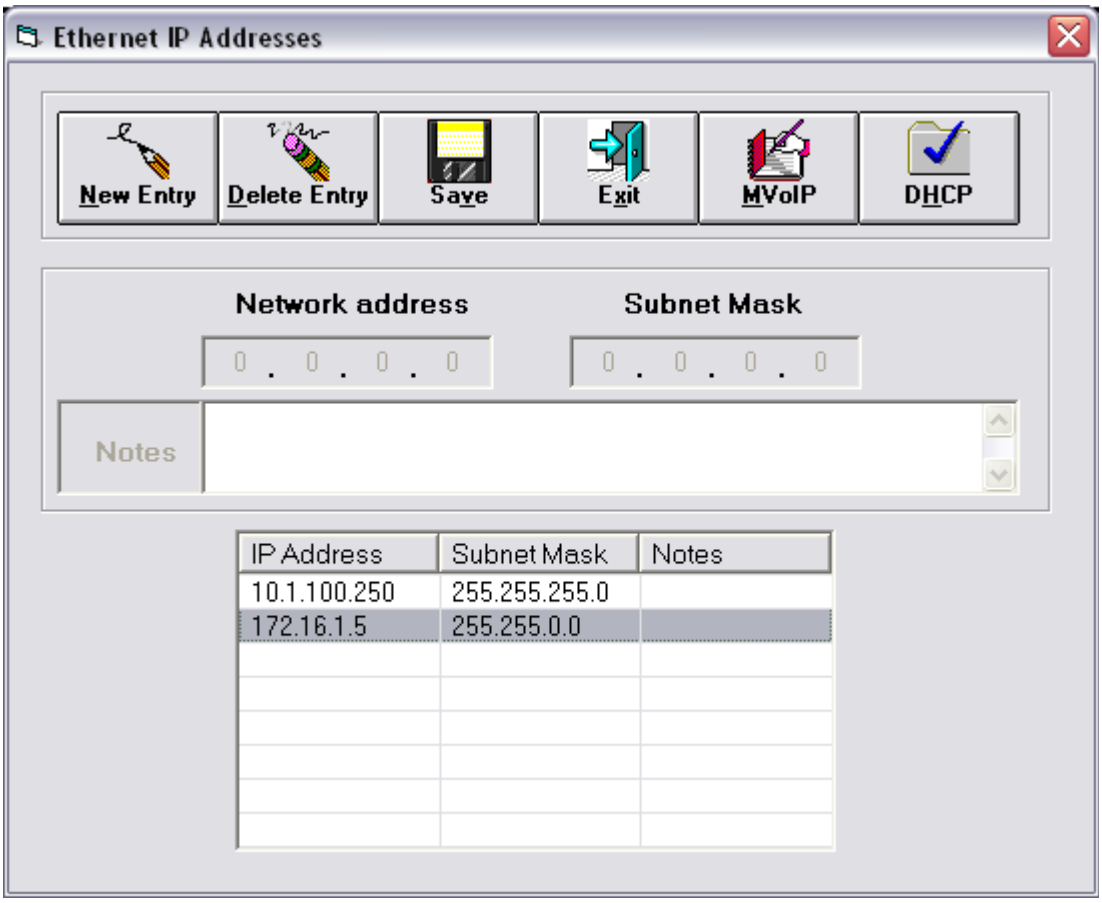
If all data entered is correct, click on ***Exit*** to close the DHCP screen. If not, correct the data and click on ***Save*** again.

To disable the DHCP server, click on the box next to ***Enable DHCP Server*** to remove the check and click on ***Save***.

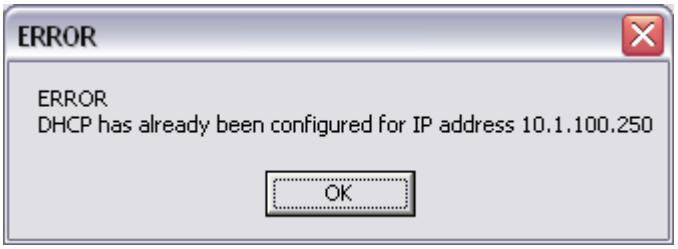
Multiple IP Addresses

In the case where there are multiple IP addresses entered in the Ethernet Configuration screen, and the DHCP server has already been configured then selecting an IP address that was not originally selected for DHCP use will cause an error.

As shown below, there are 2 IP addresses entered in the Ethernet Configuration screen, and 172.16.1.5 is currently highlighted.



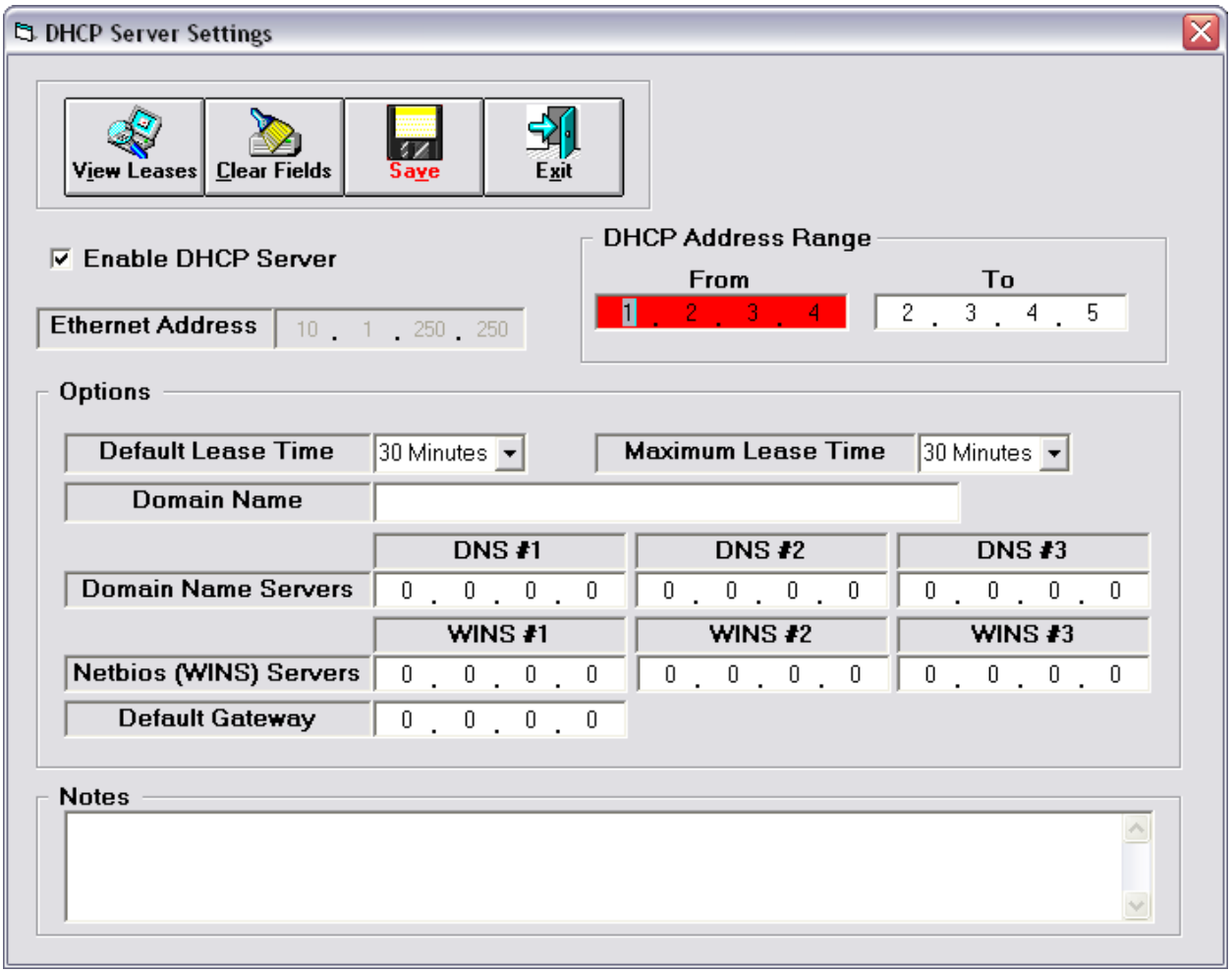
Selecting the ***DHCP*** button will cause the following error (assuming that the DHCP server has already been programmed to use the IP address of 10.1.100.250)



DHCP IP Scope

As with other DHCP servers, the IP scope (***DHCP Range From Address*** and ***DHCP Range To Address***) need to be within the same subnet as the host IP address and cannot overlap the host IP address.

In the case where there is a DHCP Range error, an error message will be displayed informing of what the error is and the DHCP Address range boxes will change to red as shown below:



As can be seen in the above screen shots, the DHCP Range From address is not in the range of the host IP address and causes an error.

DHCP Functions

Other buttons on this screen are:

Select this button to clear all the fields on the screen.

Select this button to see any DHCP leases that have been issued by the Magnum Router

Save Configuration

This option saves the current configuration in the Magnum Router Manager.
(See Save Config notes later in this chapter for important information)
This can also be accessed by pressing ALT-V, and is also available as ***Save Configuration*** from the ***Configuration*** menu.

Upon completion of the customization of the Magnum Router configuration, it is advisable that the configuration be saved for later use. To accomplish this, click on the ***Save Config*** button, or press ALT-V.

This action will bring up a file selection window where the configuration file name can be entered, and then saved. It is not necessary to put any extension on the filename, which is done automatically.

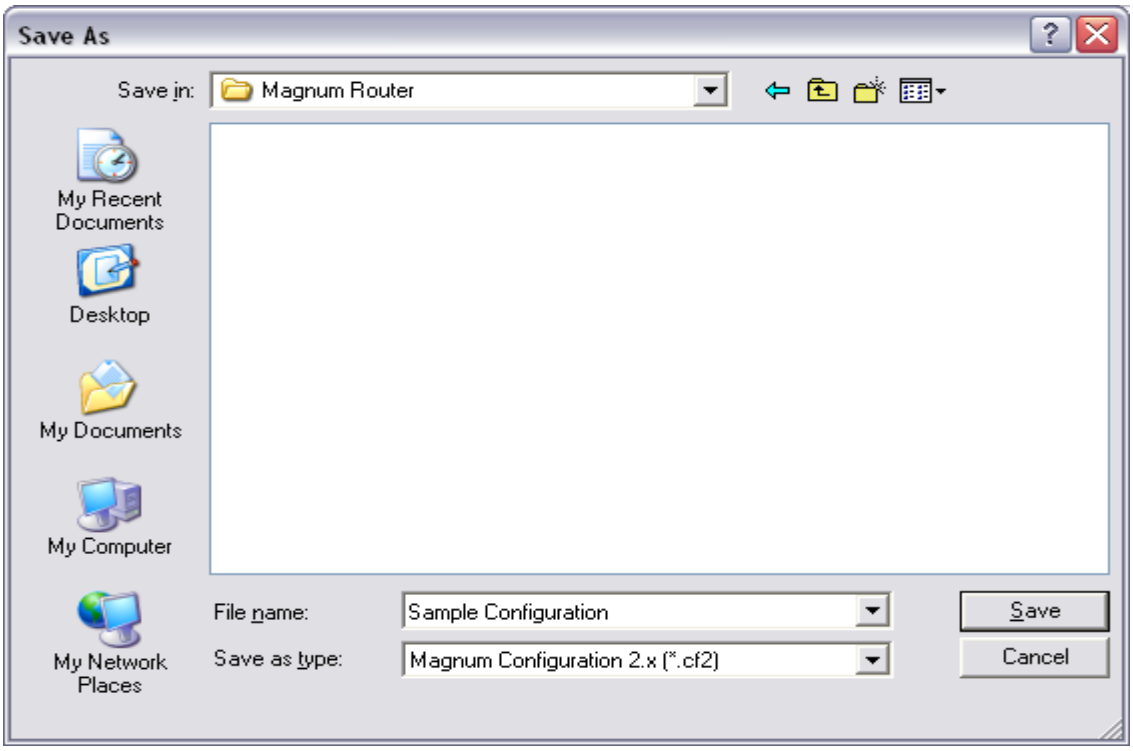


Figure 24 - Save Configuration Screen

In the above screen, the name *Sample Configuration* was entered as the filename. Once the correct name has been entered, click the ***Save*** button, or press ALT-S.

Save Configuration Notes

As of version 2.x of the Magnum Router Manager, configuration files are saved with a ".cf2" extension, where previous versions of the Magnum Router Manager saved files with a ".cfg" extension. It is possible to save any configuration as either a version 1 (.cfg) or version 2 (.cf2) format – it is strictly up to the user. It is important to note that if a configuration is saved as a version 1 format, options such as notes, DHCP and RIP Routing will not be written to the disk file. The ability to open and save previous version configurations exists for backwards compatibility.

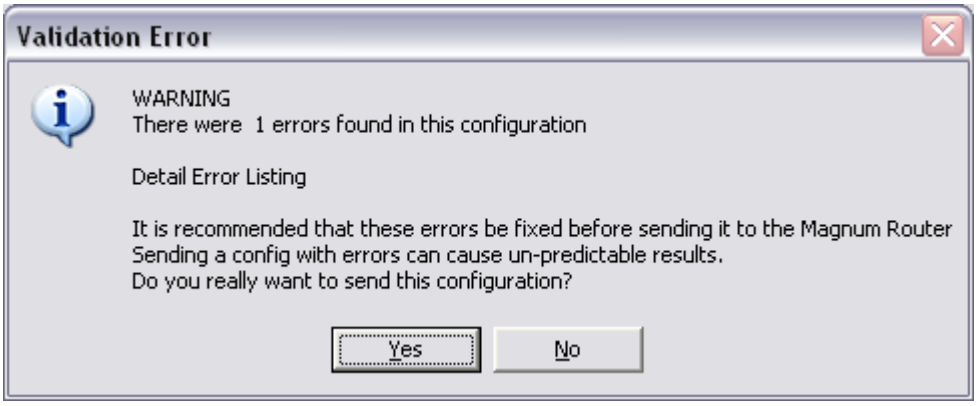
Send Configuration

Select this button to send the current configuration in the Magnum Router Manager to the connected Magnum Router.
This can also be accessed by pressing ALT-D, and is also available as ***Send Configuration*** from the ***Configuration*** menu.

The ***Send Config*** button will ONLY be available if the Magnum Router Manager is logged onto a Magnum Router.

The next item to accomplish is to transfer the saved configuration file to the Magnum Router. As mentioned earlier, no part of the input configuration is sent to a Magnum Router while being configured. Thus, this step is critical to make the customized configuration operational.

The first item that ***Send Config*** does is a cursory check of the configuration to be sent. If there are any errors or warnings found, this screen would appear:


Validation Error
WARNING
There were 1 errors found in this configuration
Detail Error Listing
It is recommended that these errors be fixed before sending it to the Magnum Router
Sending a config with errors can cause un-predictable results.
Do you really want to send this configuration?
Yes
No

It is at this time that the ***Send Config*** can be canceled by clicking ***No*** and going back to the appropriate section of the Magnum Router Manager and applying any fixes necessary, or this warning can be ignored by pressing ***Yes***.

If ***Yes*** was selected, the following screen will appear:

Click ***Send*** to send this configuration to the Magnum Router, or click ***Cancel*** to return to the Magnum Router main screen.

If ***Send*** was selected, the message bar on the screen will send informational messages to inform the user of the current status of the configuration being sent.

When the configuration send has completed, the Magnum Router main screen will be shown.

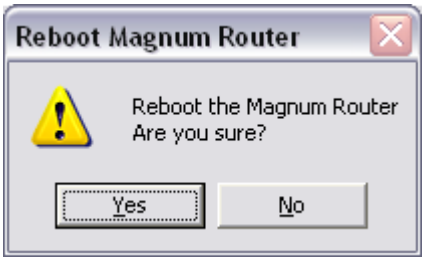
Reboot the Magnum Router

Select this button to activate a new configuration on the Magnum Router.
This can also be accessed by pressing ALT-R, and is also available as ***Reboot Router*** from the ***System*** menu.

The ***Reboot Router*** button will ONLY be available if the Magnum Router Manager is logged onto a Magnum Router.

The final step in the configuration process is to reboot the Magnum Router. The previously sent configuration has not been activated. A configuration on the Magnum Router is activated only when the unit is powered-up or rebooted.

Click on the ***Reboot Router*** or press ALT-R and the following screen will appear:



By clicking ***Yes***, the reboot process will begin. It takes approximately 2 minutes to complete a reboot, and after the reboot is complete, the Magnum Router Manager will automatically log back onto the Magnum Router.

The exception to the auto-login process is:

Telnet Login
Remote Login

If either of these login methods were used, the Magnum Router Manager cannot re-log onto the Magnum Router. This will have to be a manual process, using the ***Access*** menu of the Magnum Router Manager main screen.

Menu Bar

Figure 25 - Main Screen Menu Bar

The Menu Bar allows for more detailed access to the Magnum Router GUI Manager commands and functions. Select one of the Menu Bar items by clicking on it, or by pressing it's shortcut key (shown by an underline under a character in the menu item description when the ALT key is pressed).

All of the toolbar buttons are also located in various menu's. In this section, if a toolbar button is on a menu, the comment ***See Toolbar*** will be shown. This is done to eliminate duplicate definitions in this user guide.

Access Menu (ALT-A)

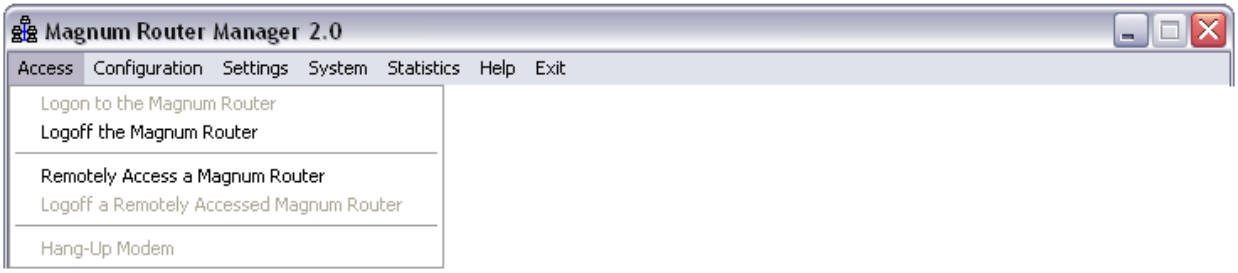

Magnum Router Manager 2.0
Access Configuration Settings System Statistics Help Exit
Logon to the Magnum Router
Logoff the Magnum Router
Remotely Access a Magnum Router
Logoff a Remotely Accessed Magnum Router
Hang-Up Modem

Figure 26 - Main Screen Access Menu

Selections in this menu allow the ability to login to a Magnum Router, or access a remote Magnum Router on the network. It is not necessary to login to a Magnum Router in order to input a configuration. The ***Access*** menu is a way to login to a Magnum at a later time.

Below is a description of this menu item's sub-menus:

Logon to the Mangum Router

Selecting this menu item shows the main login screen.

This menu item is only available if the Magnum Router Manager is not currently logged onto a Magnum Router.

Logoff the Magnum Router

This menu item terminates the connection from the Magnum Router Manager to a Magnum Router.

This menu item is only available if the Magnum Router Manager is currently logged onto a Magnum Router.

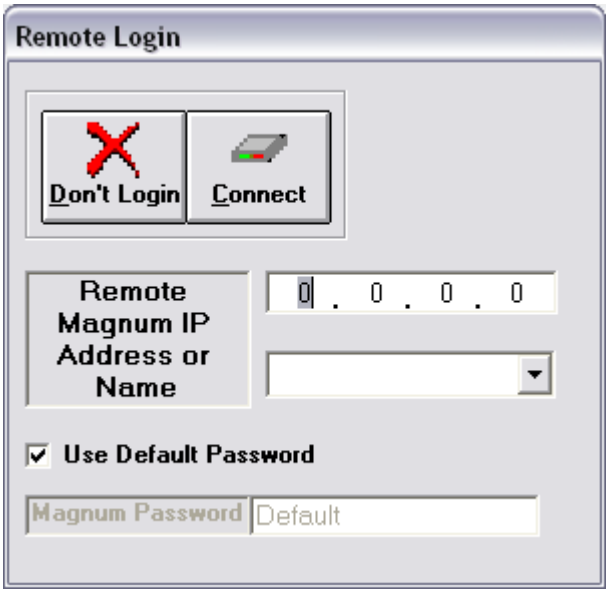
Remotely Access a Magnum Router

This menu item is used to access another Magnum Router within the network.

> This menu item is only available if the Magnum Router Manager is currently logged onto a Magnum Router.

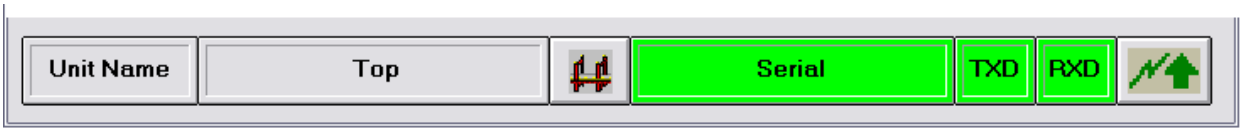
Remotely Access a Magnum Router

Select this function to access a remote Magnum Router. It is important to note that remote access is only possible if IP routing has been programmed on the Magnum Routers. If the Magnum Routers in a network are programmed for frame-switching only, then remote access is not available. Selecting this function will display the following screen:



Enter the remote IP address of the Magnum Router (and password if necessary) and click on the Connect button (or press ALT-C).

If a remote connection has been successful, the main screen will reflect this by showing the *remote icon* as shown below:



The is the remote icon. It is ONLY present when a remote unit is being accessed.

If an error occurs during a remote login attempt, the following screen will be displayed:

Clicking OK will then re-log the Magnum Router Manager onto the local Magnum Router.

Logoff a Remotely Accessed Magnum Router

This menu item terminates a login from a remotely accessed Magnum Router.

This menu item is only available if the Magnum Router Manager is currently logged onto a remote Magnum Router.

Hang-up Modem

This is used to disconnect a modem connection after logging off a Magnum Router

Configuration Menu (ALT-C)

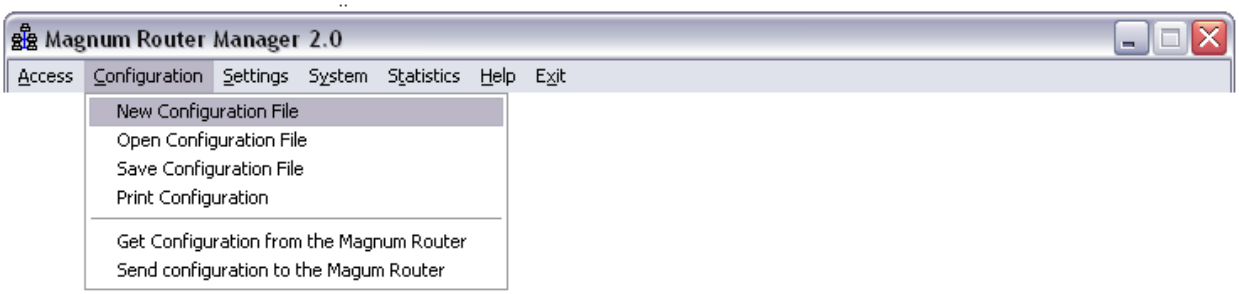


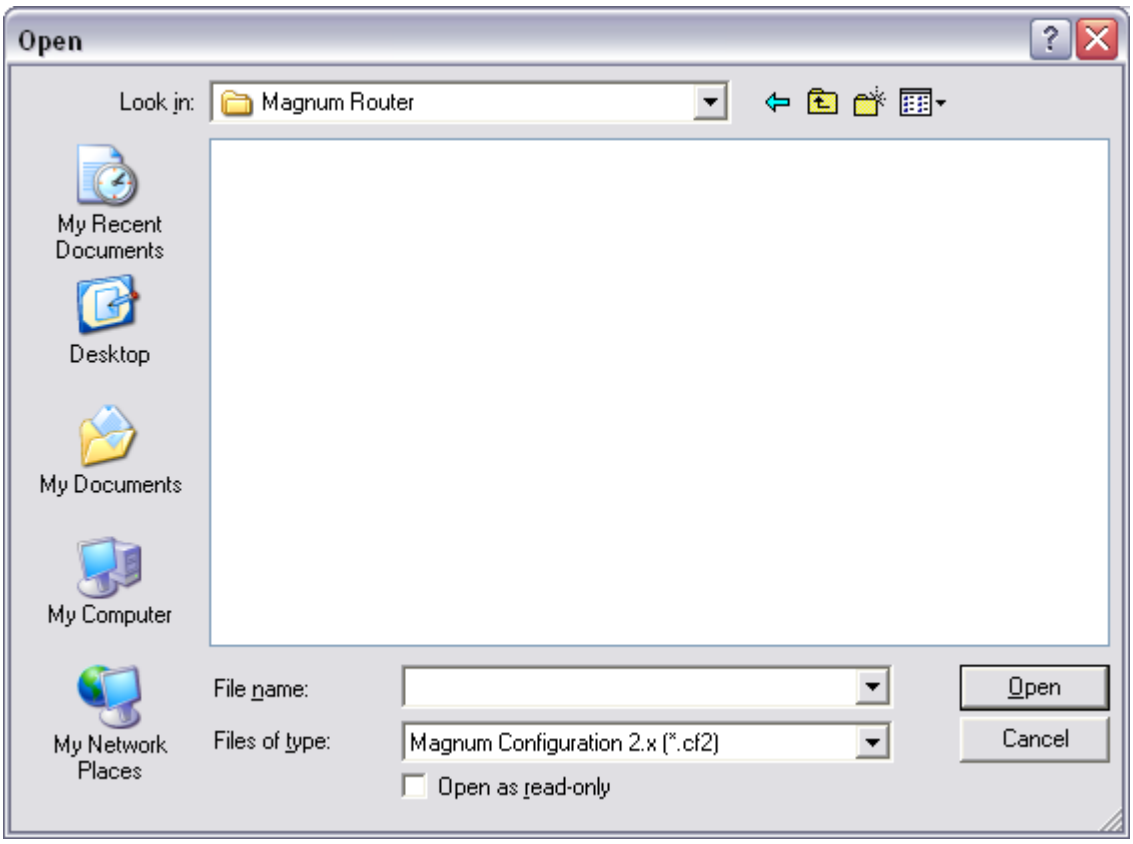
Figure 27 - Main Screen Configuration Menu

New Configuration File

This menu item is the same as clicking on the "New Config" button of the main screen. All settings within the Magnum Router Manager are defaulted and the "Set Magnum Name" screen will be displayed.

Opening Configuration File

You can access a configuration file saved on your hard drive.
When this option is selected, the file open screen will be displayed.

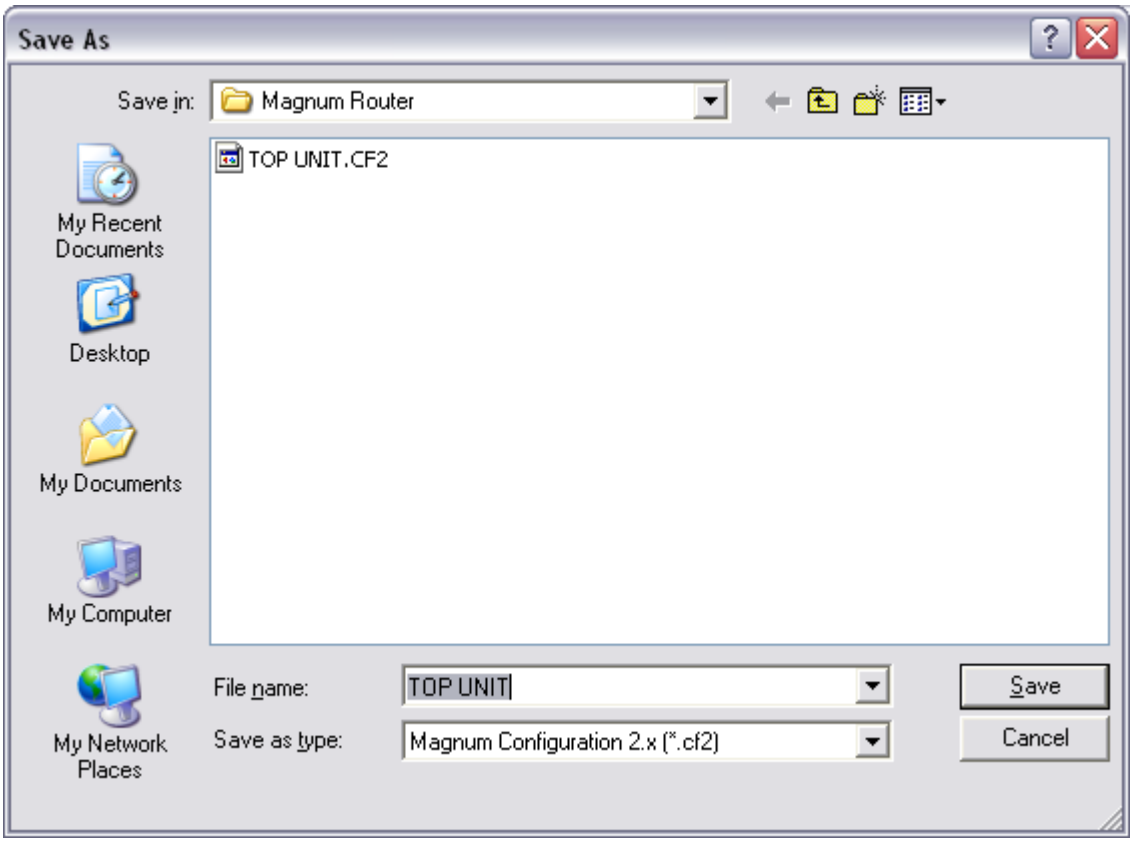


Select the configuration file desired and click on ***Open*** to load it into the Magnum Router Manager.

At noted in chapter 7, version 2.x of the Magnum Router Manager saves files with a ".cf2" extension. This is the default. If a version 1.x configuration file needs to be opened, click on the down arrow next to the *Files of type* box and select *Magnum Configuration 1.x (*.cfg)* option and the version 1.x configuration files will be displayed.

Saving Configuration Files

Saving a configuration is similar to opening a configuration file. After selecting, the following screen will appear:



At this time, the configuration file can be saved as the same name as it was loaded, or just change the configuration file in the ***File name*** box to save under a different name. And, just like Open Configuration, the configuration can be saved as a version 1.x (.cfg) or version 2.x (.cf2) configuration.

Printing a Configuration

Select this option to print or view a copy of the working configuration that is loaded in the Magnum Router Manager.

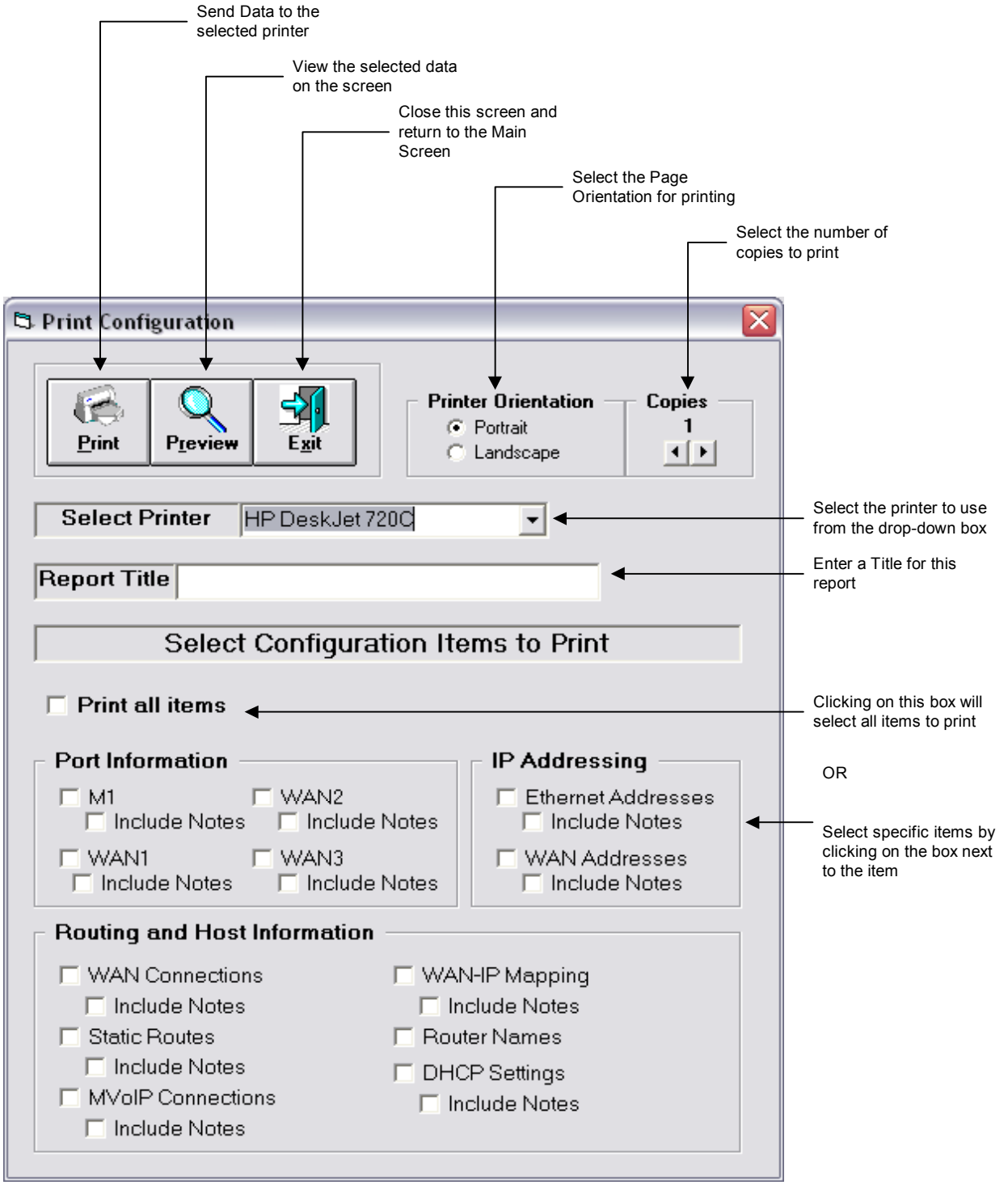


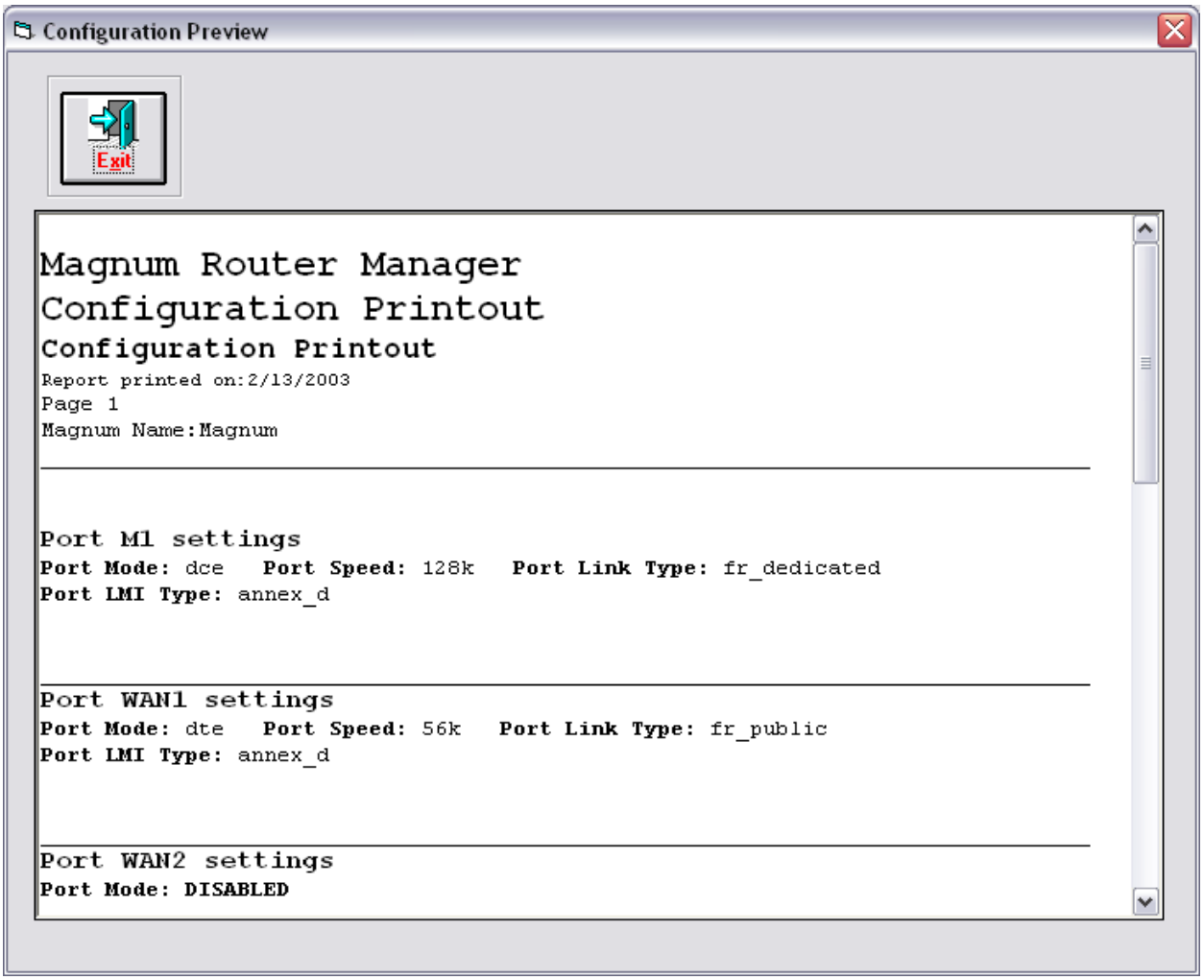
Figure 28 - Print Configuration Screen

The Select Printer field loads all the printers loaded into the PC that is running the Magnum Router Manager. Select the appropriate printer from the dropdown box.

Select the fields to print, the printer orientation and the number of copies to print, a report title and select either Print or Preview.

Print Preview
Is an easy way to see what the configuration looks like before actually making a hard copy of the configuration.

Below is an example of what the Print Preview might look like:



Get A Configuration from Magnum Router

Select this option to load the configuration from a local or remote Magnum Router into the Magnum Router Manager.

Send Configuration to the Magnum Router

This option is the same as clicking on the "Send" button of the main screen. It's function is to send the configuration that is currently being worked on in the Magnum Router Manager to the Magnum Router.

Sending the configuration to the Magnum Router does not cause the Magnum Router to begin using any changes instantly. The Magnum Router needs to be rebooted for configuration changes to be used.

Settings Menu (ALT-S)

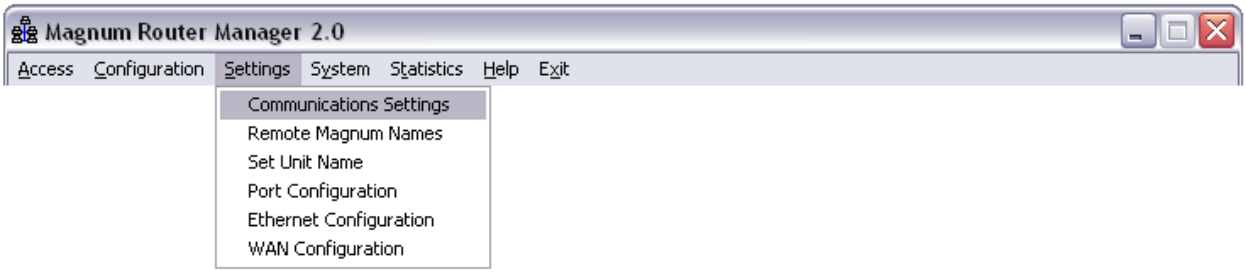


Figure 29 - Main Screen Settings Menu

This menu allows for setting several options for the Magnum Router.

This menu is ONLY accessible if the Magnum Router Manager is logged onto a Magnum Router.

Communications Settings

Selecting the COMMUNICATIONS SETTINGS from the menu will display the main communications setup screen. This screen (which is shown when the Magnum Router Manager is first started) gives the ability to change the communications port that will be used to connect to a Magnum Router. It can further allow entry for any special modem commands for dialing up a Magnum Router. Refer to Chapters 5 and 6 for more information.

Remote Magnum Names

The Magnum Router Manager gives users the ability to associate a name with an IP address, thus making it an easier task to connect to a remote node, or ping a remote site. Select REMOTE MANGUM NAMES and the following screen will be displayed.

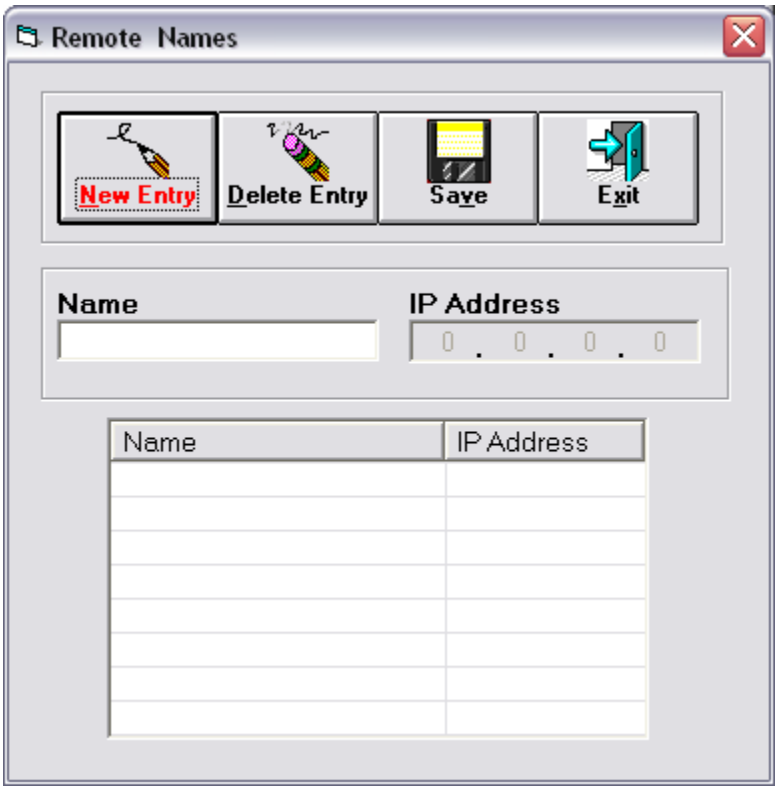


Figure 30 - Remote Names Screen

Adding a Remote Name Entry

To add an entry in the Router Names screen, do the following steps:

1. Click on ***New Entry*** or press ATL-N
2. Type in the Router Name and the IP Address
3. Click ***Save Edit*** or press ALT-V
4. Click ***Exit Edit*** or press ALT-X

If you have more than one Remote Name to enter, return to step 1 and continue until all names have been entered. Once complete, click on the ***Save*** button to save the entries. Click on ***Exit*** to return to the Main Screen

Changing a Remote Name Entry

It is possible to change an entry after it has been entered into the table. Follow these steps to change an entry:

1. Double-Click on the entry that needs modification in the table
   This will cause all of the entry data to be loaded in the fields above the table.
2. Make any modifications required
3. Click on ***Save Edit*** or press ALT-V
4. Click on ***Exit Edit*** or press ALT-X

If this entry was selected by mistake and is not the one that needed modification, just click on the "Exit Edit" or press ALT-X.

Deleting a Remote Name Entry

In some cases, an entry may need to be deleted. To do this, follow these steps:

1. Select an entry in the table.
2. Either click the ***Delete Entry*** button or press ALT-D.
3. A verification question is asked to make sure that this is the entry to delete, if it is, select yes.

Repeat for each entry that if to be deleted.

Set Unit Name

Selecting this option will display the ***SET MANGUM NAME*** screen. This allows for a Magnum Router to be given a unique name for documentation purposes.

Port Configuration

Selecting the PORT CONFIGURATION is the same as clicking on the PORT CONFIG button of the main screen. ***See Toolbar***.

Ethernet Configuration

Selecting the ETHERNET CONFIGURATION is the same as clicking on the ETHENET CONFIG button of the main screen. ***See Toolbar***.

WAN Configuration

Selecting the WAN CONFIGURATION is the same as clicking on the WAN CONFIG button of the main screen. ***See Toolbar***.

System Menu (ALT-Y)

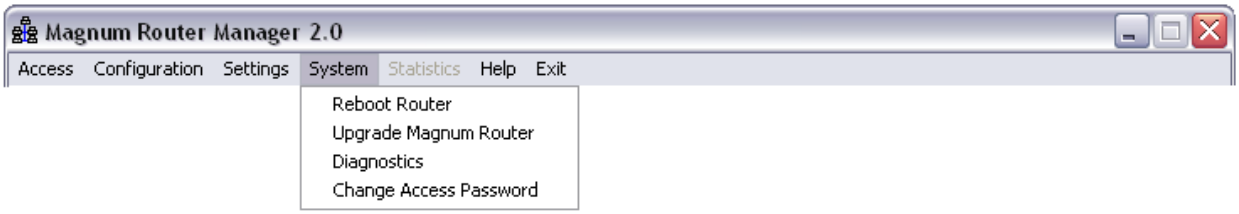


Figure 31 - Main Screen System Menu

This menu is concerned with system level functions of the Magnum Router.

This menu is ONLY accessible if the Magnum Router Manager is logged onto a Magnum Router.

Reboot Router

Selecting the ***Reboot Router*** menu item is the same as clicking on ***Reboot Router*** from the main screen.

Upgrade Magnum Router

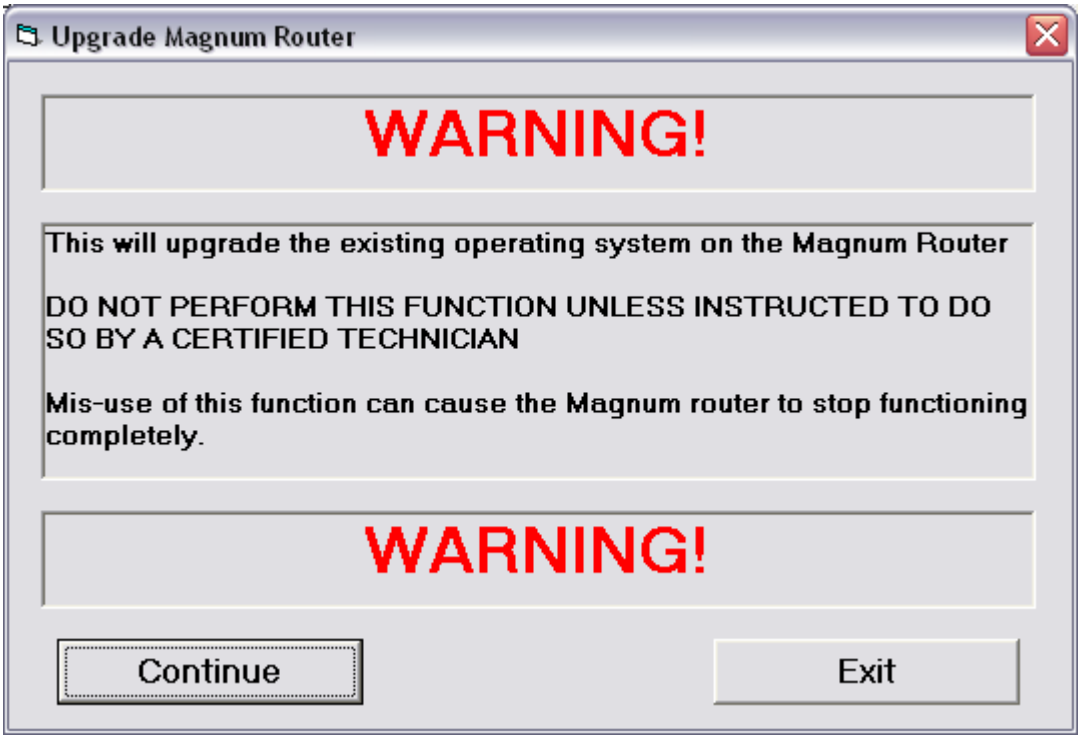
The Magnum Router is a product that is constantly being updated and improved upon. The Upgrade Magnum Router function is a simple way to bring a Magnum Router up to the latest revision so that any new functions or improvements can be utilized.

Upgrade files may be supplied via a compressed folder, or can be located on a supplied CD. Uncompress the folder into a temporary file area before beginning the upgrade procedure.

IMPORTAINT NOTE: A Magnum Router Upgrade requires that the PC that is running the Magnum Router Manager have IP access to the Magnum Router. If the PC does not have IP access, then the Update ***WILL*** fail.

Once the Upgrade files are uncompressed to the PC's hard disk drive, select ***Upgrade Magnum Router*** from the ***System*** menu.

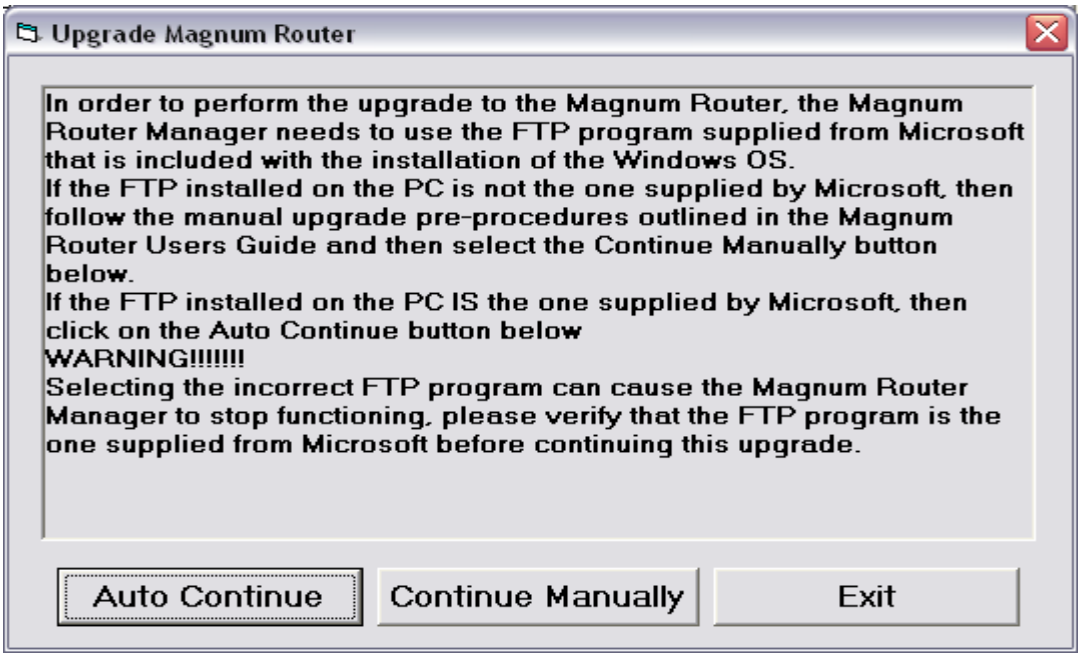
The following screen will be displayed:


Upgrade Magnum Router
WARNING!
This will upgrade the existing operating system on the Magnum Router
DO NOT PERFORM THIS FUNCTION UNLESS INSTRUCTED TO DO SO BY A CERTIFIED TECHNICIAN
Mis-use of this function can cause the Magnum router to stop functioning completely.
WARNING!
Continue
Exit

Click ***Continue*** to proceed, or click ***Exit*** to return to the Magnum Router Main Screen.

Once the upgrade process has started, it cannot be stopped.

Clicking on the Continue button will display the following screen:


Upgrade Magnum Router
In order to perform the upgrade to the Magnum Router, the Magnum Router Manager needs to use the FTP program supplied from Microsoft that is included with the installation of the Windows OS.
If the FTP installed on the PC is not the one supplied by Microsoft, then follow the manual upgrade pre-procedures outlined in the Magnum Router Users Guide and then select the Continue Manually button below.
If the FTP installed on the PC IS the one supplied by Microsoft, then click on the Auto Continue button below
WARNING!!!!!!!
Selecting the incorrect FTP program can cause the Magnum Router Manager to stop functioning, please verify that the FTP program is the one supplied from Microsoft before continuing this upgrade.
Auto Continue
Continue Manually
Exit

As stated in the above screen, the upgrade program needs to use the Microsoft FTP program that is supplied with the Windows operating system. If the FTP program on the PC that is running the Magnum Router Manager uses a third party FTP client program, then a manual upgrade will be required.

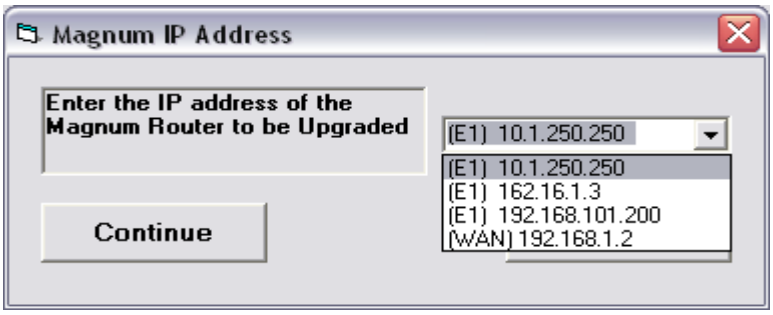
If the PC running the Magnum Router Manager does have the Microsoft FTP client program, then click on ***Auto Continue***.

If a manual upgrade is required, perform the following steps:

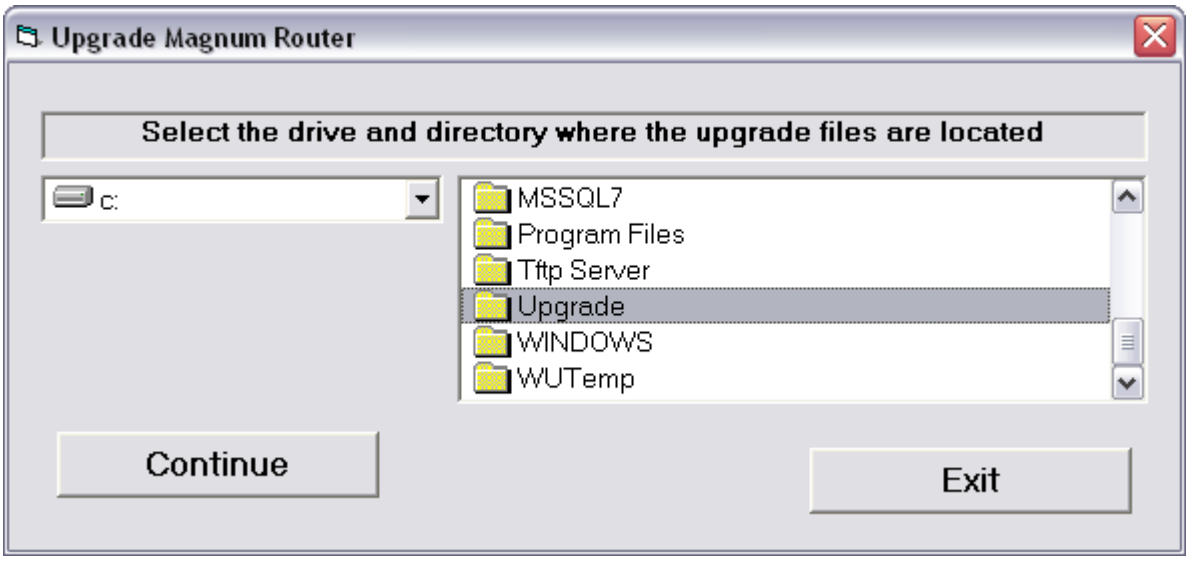
- Start the FTP client program and access the Magnum Router
- Enter the username of ***magnum***
- Enter a password of ***magnum***
- Send all files located in the temporary directory
- Logoff the Magnum Router

Once these steps have been completed, click on the ***Continue Manually*** button at the bottom of the screen and refer to the **Magnum Router Upgrade (continued)** section of this chapter.

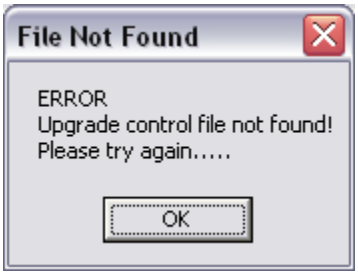
The next step is to identify which IP address to send the files to. All of the IP addresses assigned to a Magnum Router are automatically loaded. Select the appropriate IP address and click “Continue” to proceed, or click “Cancel to return to the Magnum Router Manager Main Screen.



The next step is to inform the Magnum Router Manager where to find the update files. Do this by selecting the hard disk and directory where the Update files were de-compressed.



The Magnum Router Manager will then verify that the upgrade files are correct. If there is an error, or if the proper update files are not found, the following error is displayed:



Click on ***OK*** and re-select the hard drive / directory as described in the above section.

After copying the files from the PC to the Magnum Router, the Magnum Router Manager verified that all of the files have been copied correctly. If there is an error, the following will be displayed:

VERIFY ERROR
VERIFY ERROR
The upgrade program was not able to verify that all files were copied to the Magnum Router
Upgrade is not able to continue.
OK

If this error appears, click on ***OK*** and try the upgrade process again.

Once the files have been verified, the Magnum Router Manager will try and access the Magnum Router. If that step is successful, the upgrade files will be transferred and installed. The upgrade screen will post updates as they become available as shown below.

This screen just shows the Magnum Router Manager in the process of sending the upgrade files to the Magnum Router

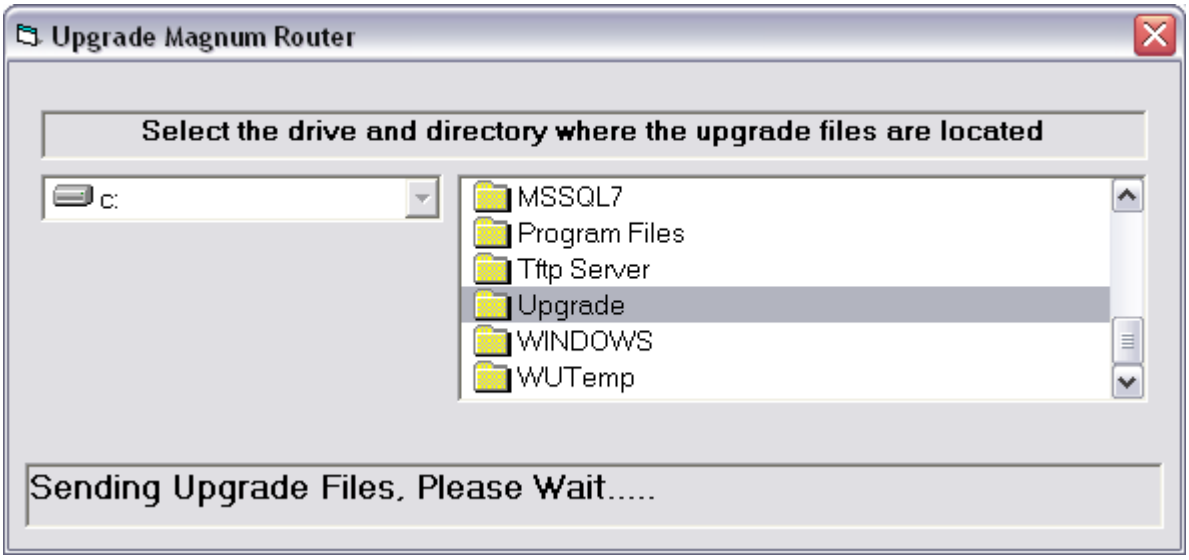


Figure 32 - Upgrade Magnum Router, Sending File screen

This display is to let the user know that the file transfer has completed, and the update is proceeding by processing a specific set of commands.

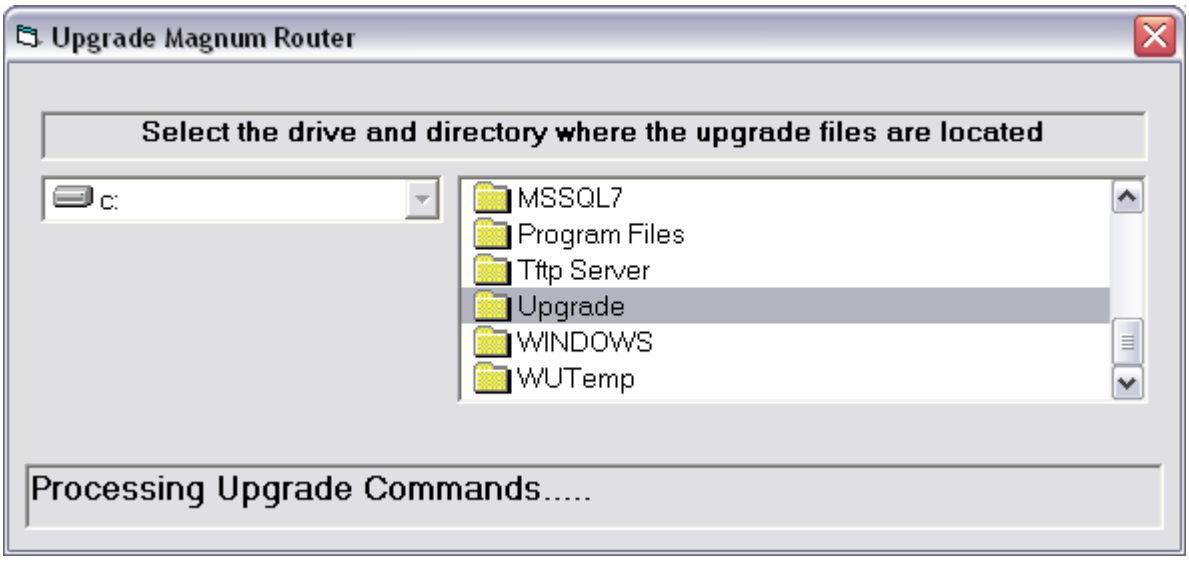


Figure 33 - Upgrade Magnum Router, Process Upgrade Commands Screen

Once all steps have been completed, a message will display signifying that the upgrade has completed.

Click on ***OK*** to return to the Magnum Router Manager Main Screen.

After an upgrade, it is advised that the Magnum Router be rebooted to allow changes to take effect, although this is not an immediate requirement.

Diagnostics

The DIAGNOSTIC screen gives a simple set of tools to check connectivity, DLCI status, and IP Routes on a Magnum Router.

Below is the overview of the DIAGNOSTIC screen.

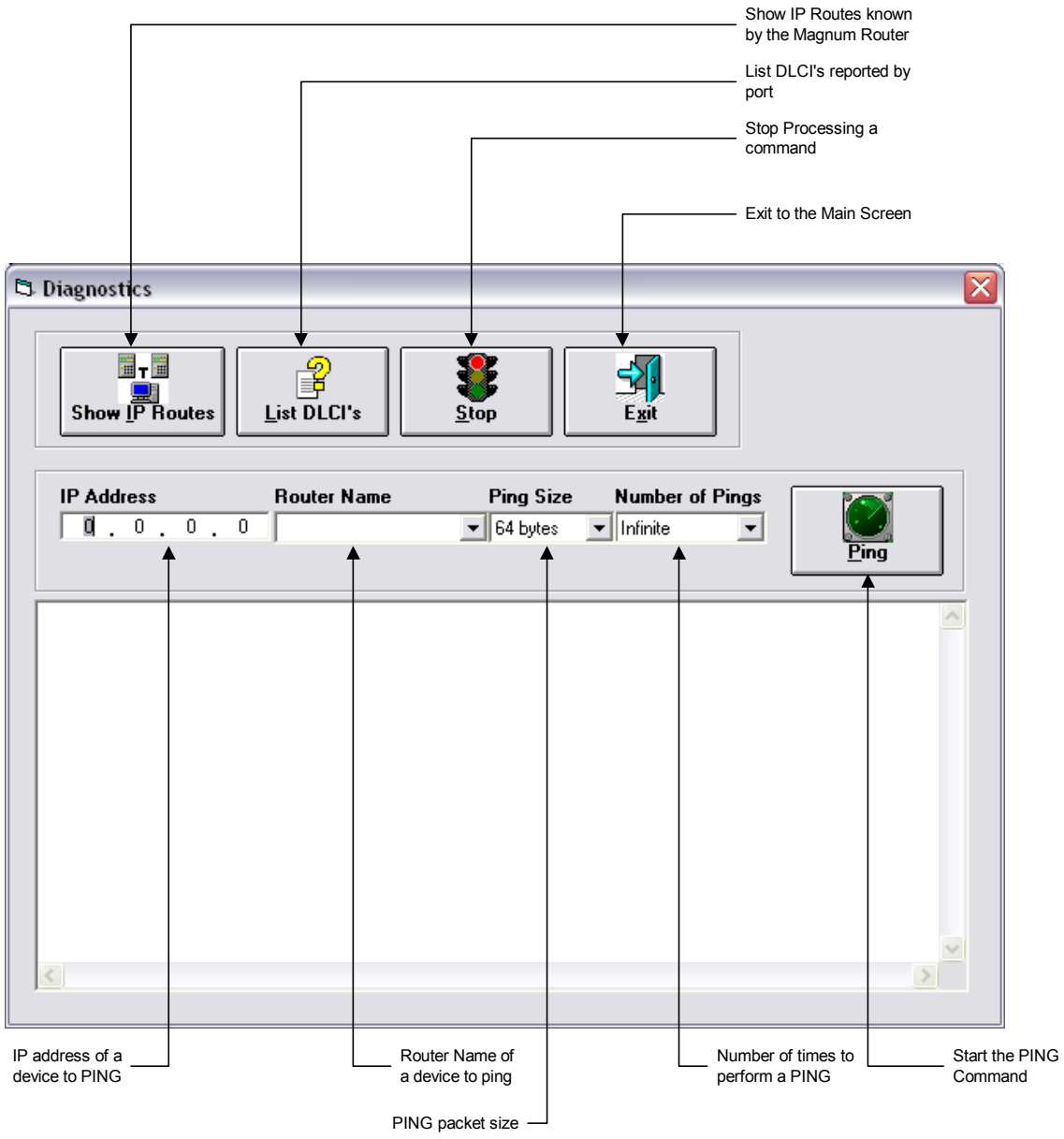


Figure 34 - Diagnostics Screen

PING

The most used test function on a router is the PING command. This command allows for the verification that a specified IP Host device is active. To perform the PING command from the DIAGNOSTICS screen, enter either the IP address of the IP host, or select it from the Router Name field. Other options for the PING command include the PING packet size and the number of PING's to perform.

Once all data is entered, click on the PING button, or press ALT-P.

Below is an example of the PING output

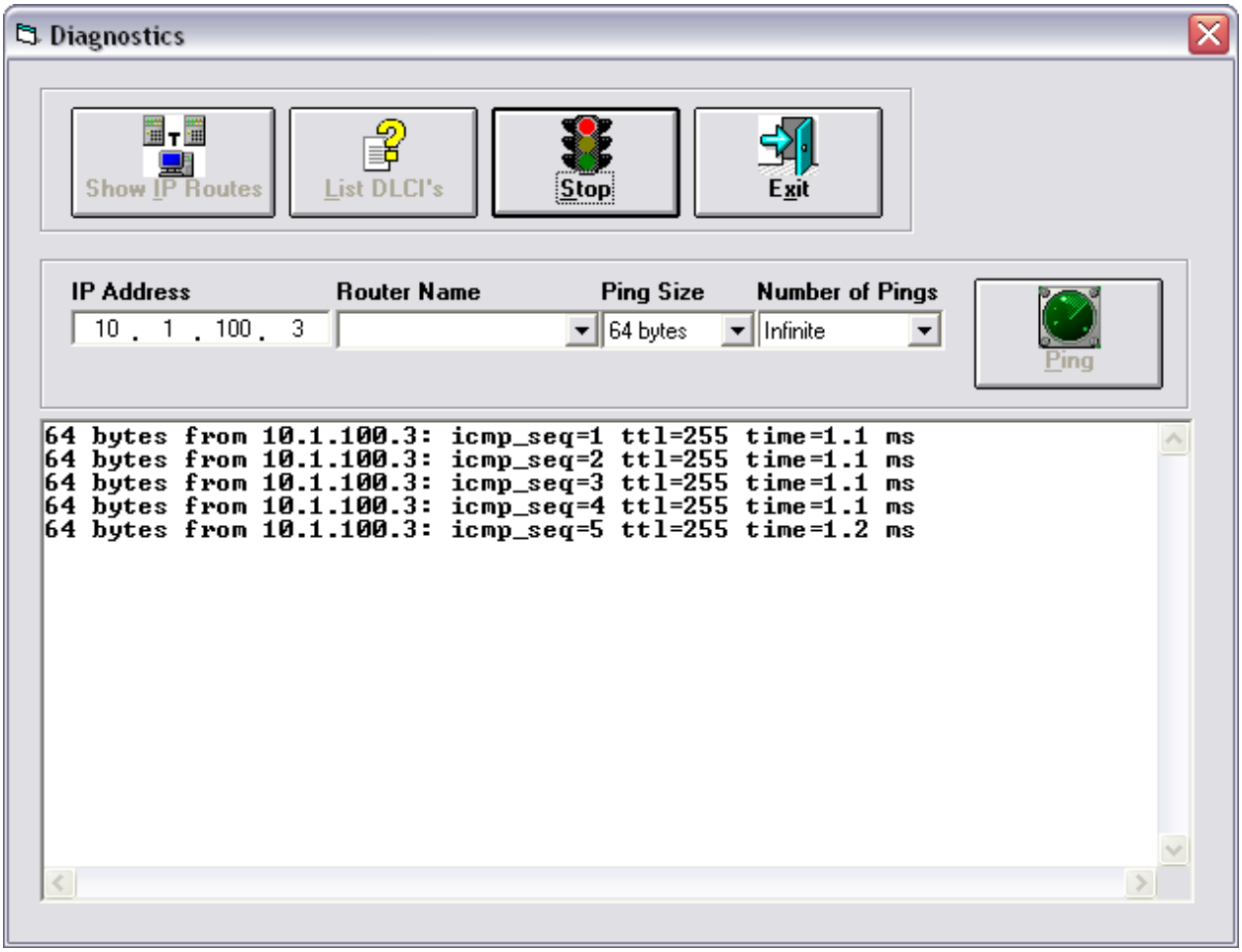


Figure 35 - Diagnostics Screen, Ping Response

To stop a PING at any time, either click on EXIT or STOP. If STOP is selected, or if the requested number of PING's has been reached, the following screen will be displayed:

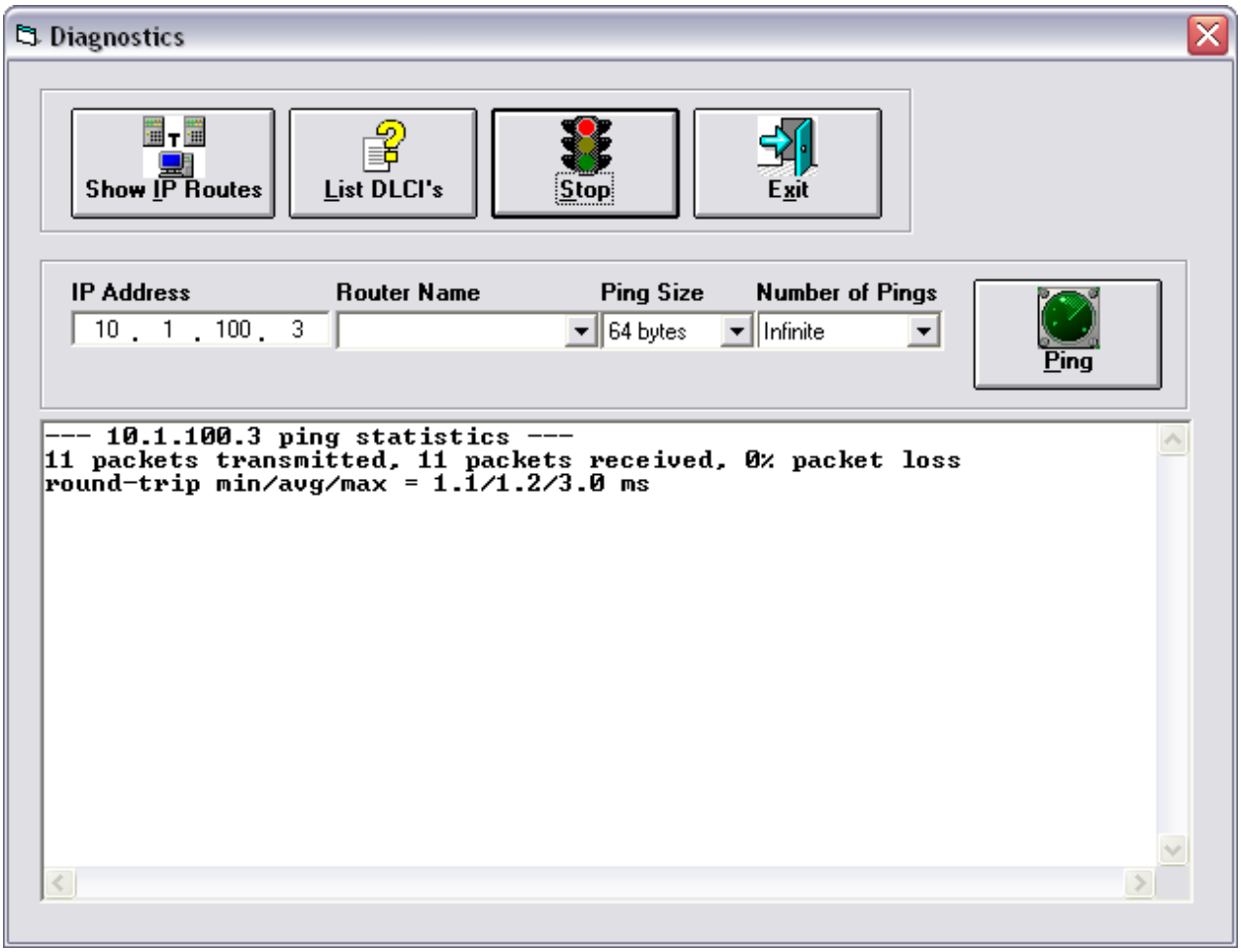
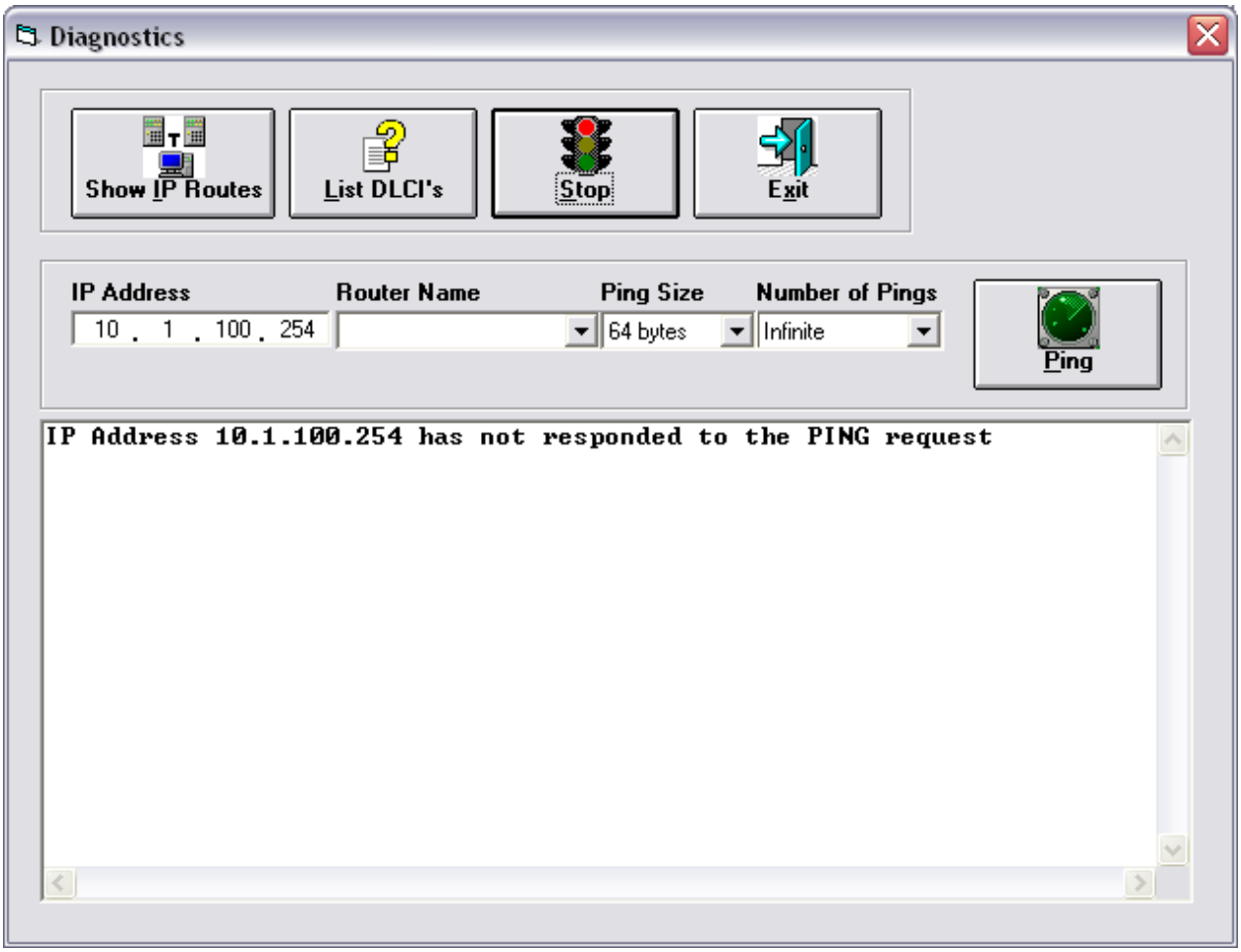


Figure 36 - Diagnostics Screen, Ping Completion

If the IP Host that is being PING'ed does not respond to requests within 10 seconds, the PING command automatically terminates and the following screen is displayed:



Show IP Routes

The Show IP Routes command shows any routes that have been programmed into the Magnum Router. It does not differentiate between static routes or routes that have been dynamically learned.

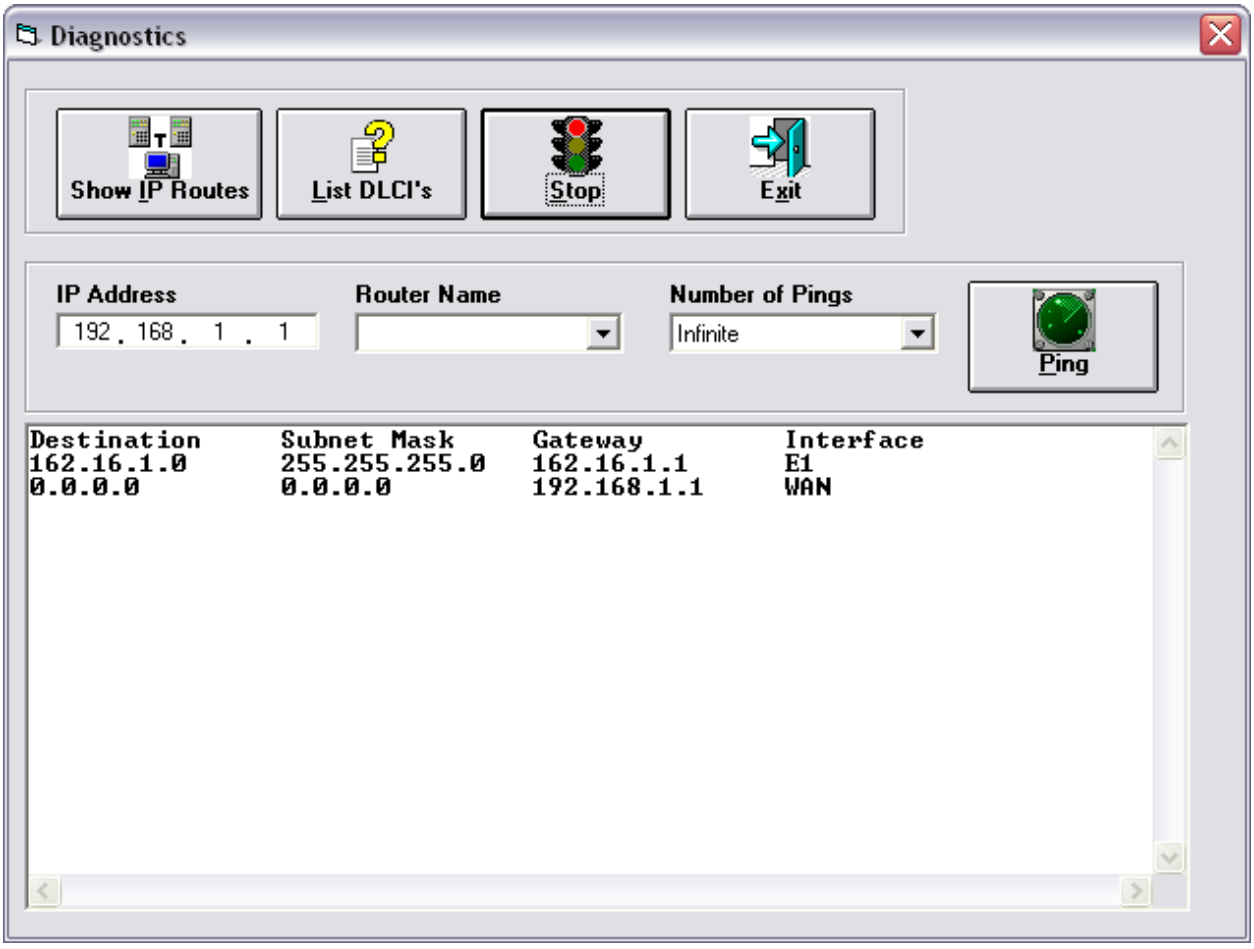


Figure 37 - Diagnostics Screen, Show IP Route

List DLCI's

The List DLCI's command is used to report the DLCI's that have been reported on each port. This includes any that have been programmed, and any that have been learned from any other source. This screen just reports the DLCI's, it DOES NOT display detailed DLCI information, use the ***Display Port Statistics*** command in the ***Statistics*** menu for detailed DLCI status information.

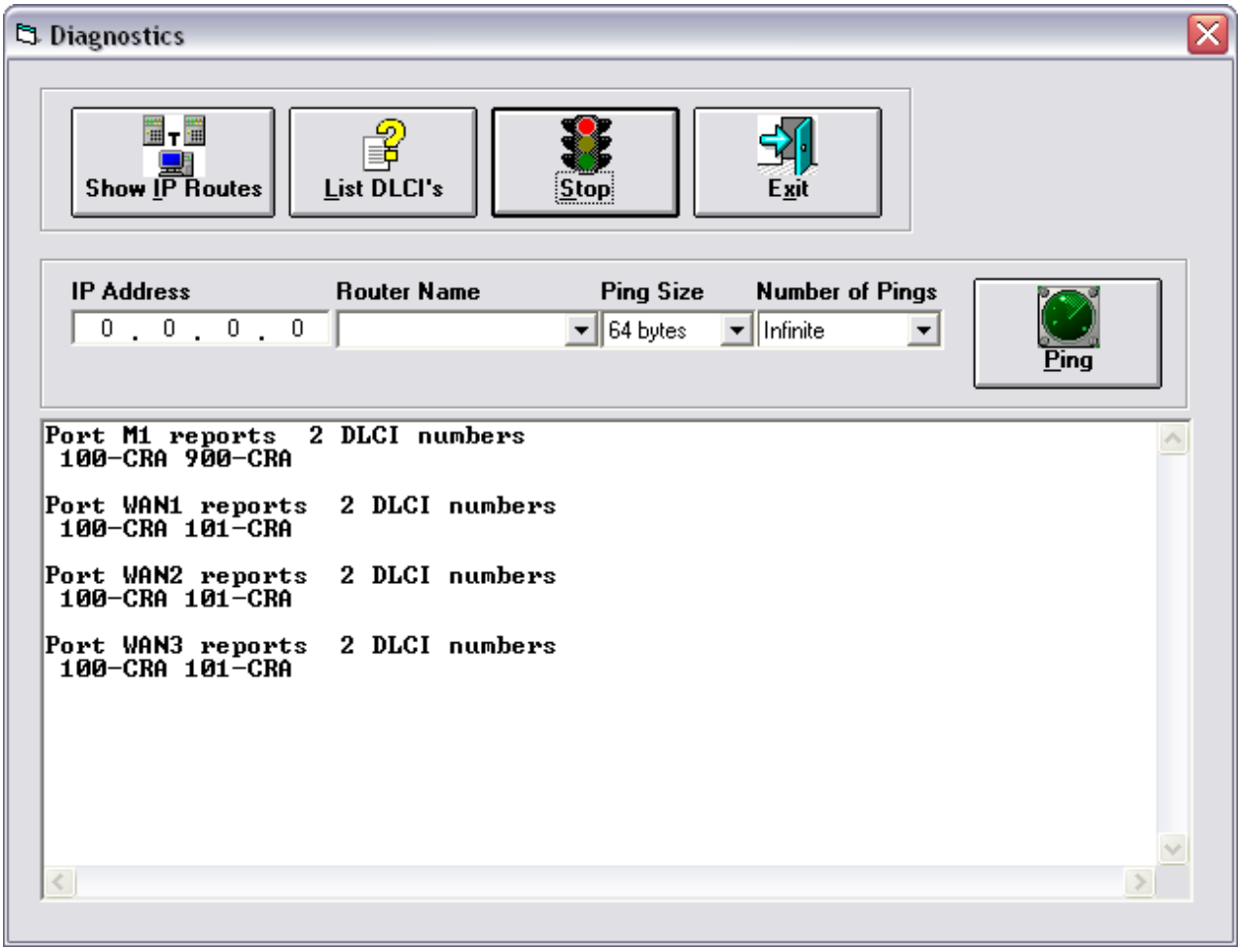


Figure 38 - Diagnostics Screen, List DLCI's

Next to each listed DLCI is the state of the DLCI.

C means that the listed DLCI has been configured
R means that the listed DLCI has been reported
A means that the listed DLCI is active

This information is also supplied in the ***Display Detailed Port Information*** menu item of the ***Statistics*** menu.

Change Access Password

In some cases, it may be necessary to change the default access password of a specific Magnum Router. **ALTHOUGH IT IS NOT RECOMMENDED**, the Magnum Router Manager has the ability to change the default access password to any other password, so long as the length of that password is greater than 6 characters.

To change the access password, begin by selecting ***Change Access Password*** from the ***System*** menu. Once selected, the following warning message will appear:

WARNING!
WARNING!
Changing the access password will cause any Magnum Router Manager version 1.x to not work with this unit.
Further, if the password is forgotten, it may only be recoverable by factory authorized personnel through a process that could take from 24 to 48 hours.
If the password is not recoverable, the Magnum Router will have to be replaced.
Are you sure that you want to proceed?
Yes
No

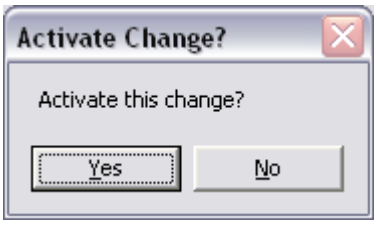
Selecting ***YES*** will continue to the password entry screen, selecting ***NO*** will return to the Main Screen.

Enter the new password desired in the first text box, and repeat it in the second text box.

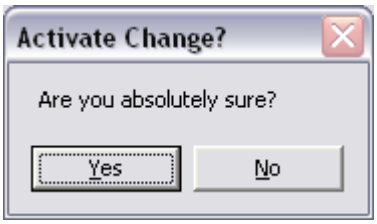
IMPORTAINT NOTE: Passwords are case sensitive! The password "Magnum" is different from the password "magnum". Thus it is VERY IMPORTAINT that careful attention is paid when entering the new passwords. Further, if a password is forgotten then the user will have to contact the distributor for password recovery.

Once all fields have been entered, click on ***Save*** (or press ALT-V) and then click on ***Exit*** (or press ALT-X.

The first warning message will be displayed:



Selecting ***Yes*** will then display a second warning message



Selecting ***Yes*** again will then change the access password of the Magnum Router. Selecting ***No*** on either of the warning messages will return to the Main Screen.

Statistics Menu (ALT-T)

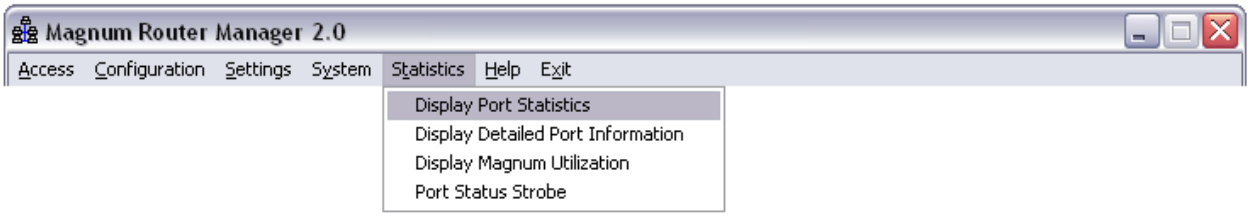


Figure 39 - Main Screen Statistics Menu

This menu is used to show the current condition of the Magnum Router. Port status, link information and Magnum Router utilization are just some of the items available for display from this menu.

This menu is ONLY accessible if the Magnum Router Manager is logged onto a Magnum Router.

As will be noticed throughout this chapter, many of these screens show a great amount of data. It can take up to 30 seconds to get all the required data for display to complete. Further, several of these screens allow for an "Update Interval" change that ranges from 30 seconds to 1 hour. By default, all "Update Interval" settings are at 60 seconds. Setting them down to 30 seconds, or by manually updating the data as fast as possible will adversely impact the performance of the Magnum Router and in some cases may cause the Magnum to stop functioning, requiring a reboot to correct the failure. It is recommended that an "Update Interval" time be either left at 60 seconds, or be increased if the Magnum Router Manager is to be used for long term monitoring.

Display Port Statistics

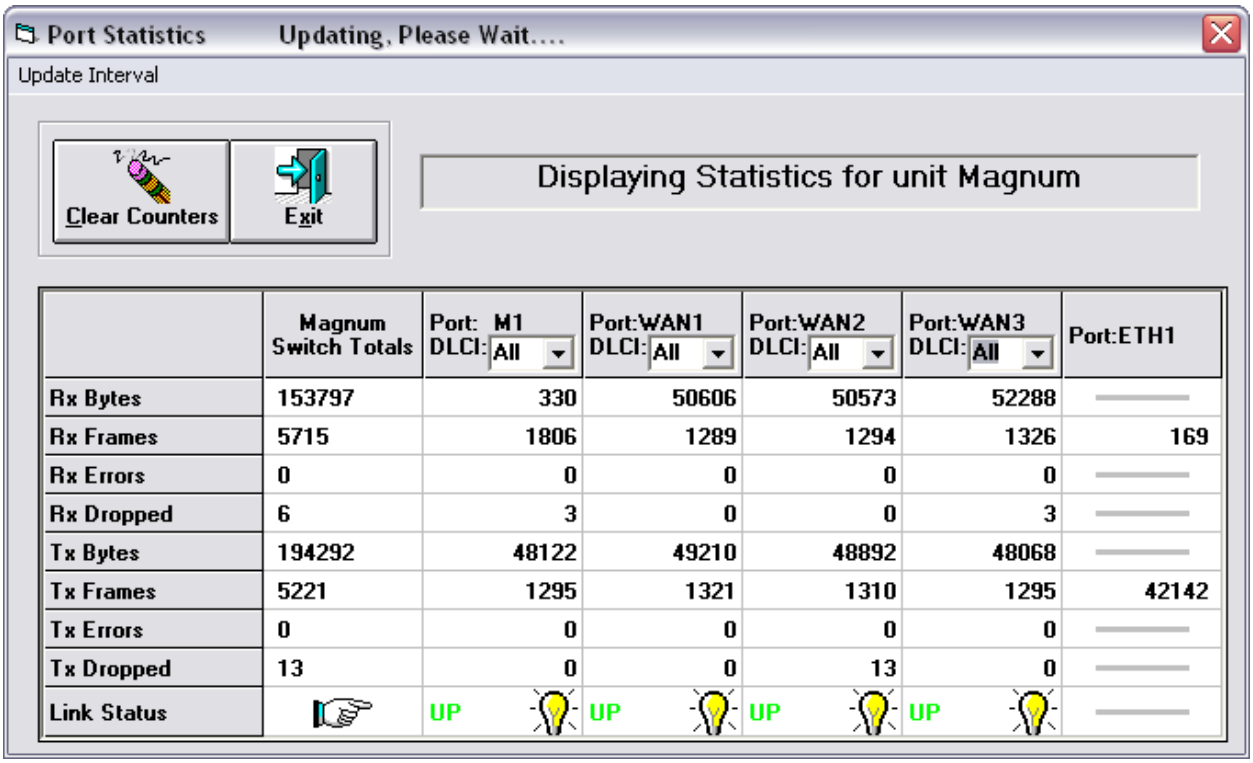

Port Statistics
Updating, Please Wait....
Update Interval
Clear Counters
Exit
Displaying Statistics for unit Magnum
Magnum Switch Totals
Port: M1 DLCI: All
Port:WAN1 DLCI: All
Port:WAN2 DLCI: All
Port:WAN3 DLCI: All
Port:ETH1
Rx Bytes 153797 330 50606 50573 52288
Rx Frames 5715 1806 1289 1294 1326 169
Rx Errors 0 0 0 0 0
Rx Dropped 6 3 0 0 3
Tx Bytes 194292 48122 49210 48892 48068
Tx Frames 5221 1295 1321 1310 1295 42142
Tx Errors 0 0 0 0 0
Tx Dropped 13 0 0 13 0
Link Status UP UP UP UP

Figure 40 - Port Statistics Screen

The Port Statistics screen gives the ability to monitor port status and see how each port is transferring data. Next to each port is a drop-down box that can also give the added ability to monitor specific DLCI's on a port, or all DLCI's of a port. The ability to monitor a specific DLCI gives "drill-down" diagnostics of the health of a circuit.

Below is a description of the fields on this screen:

Rx Bytes - The total number of bytes received since the unit was started, or since the last time the counters were cleared.
Tx Bytes - The total number of bytes transmitted since the unit was started, or since the last time the counters were cleared.
Rx Frames - The total number of frames received since the unit was started, or since the last time the counters were cleared.
Tx Frames - The total number of frames transmitted since the unit was started, or since the last time the counters were cleared.
Rx / Tx Errors - The total number of frames with illegal DLCI's or bad LMI (Link Management Information) frames received.
Rx /Tx Dropped - The total number of frames dropped because the DLCI is down or unmapped, the port is down, or there is a lack of memory.
Link Status - Displays the status of the link. There are three possible values:
UP - Indicates that the link is operational.
DOWN - Indicates that the link is not operational.
NEVER UP - Indicates that the link has never been operational since the last power up or reboot.

Clearing the Statistics Counter

Click on the ***Clear Counters*** (or press ALT-C) to perform a clearing of the counters. This action ONLY clear counters on the WAN ports of the Magnum Router, not the Ethernet port.

Display Detailed Port Information

The ***Display Detailed Port*** Information screen gives a more comprehensive overview of the port status and gives additional information such as DLCI status and how the port is presently programmed. It does not supply such information as port and DLCI counters.

This screen does NOT automatically update itself. If the data needs to be updated, click on the "Update" (or press ALT-U).

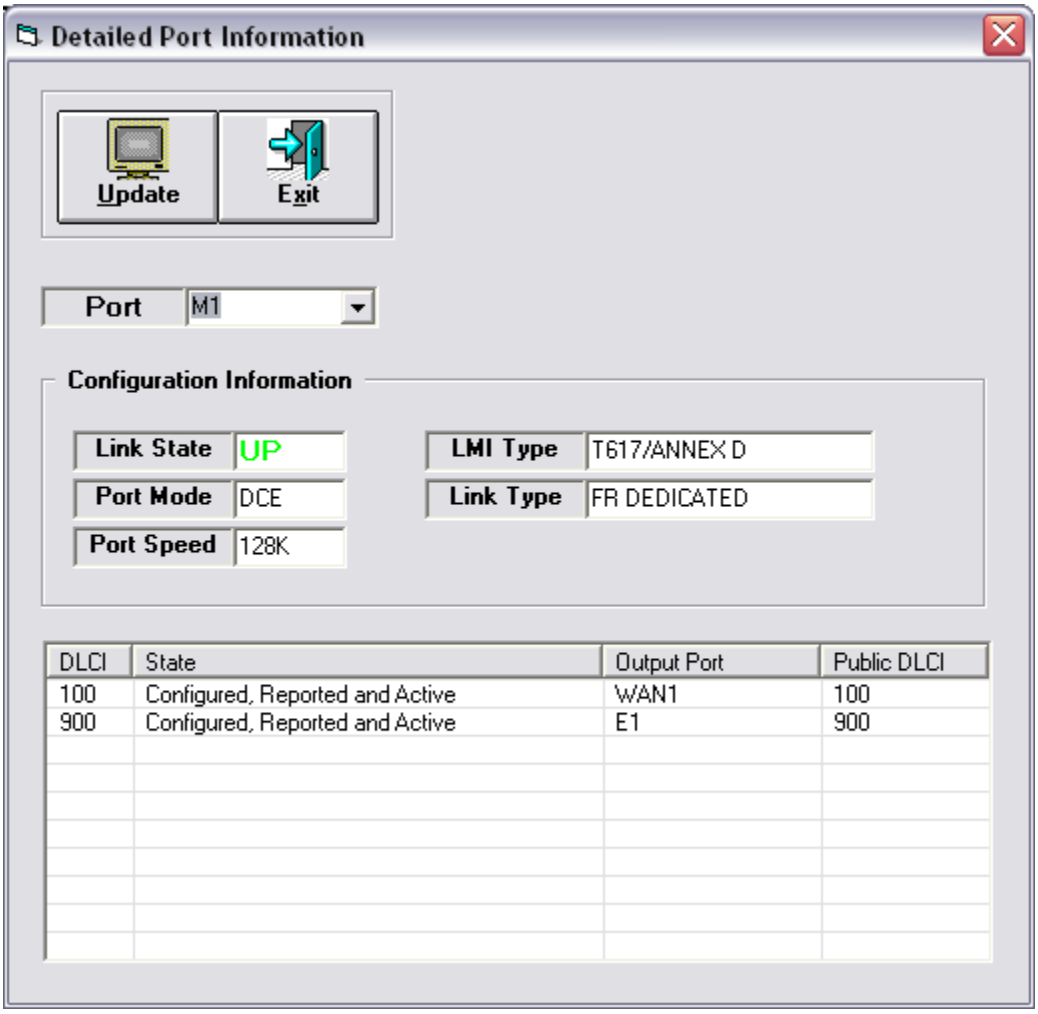


Figure 41 - Detailed Port Information Screen

DLCI State Information

As seen in the above screen, the ***Detailed Port Information*** screen reports DLCI's that have been either programmed or reported on the port specified in the ***Port*** dropdown box. The possible states for a DLCI are:

Configured, Reported and Active:
The DLCI is up and operational

Configured, NOT Reported and Active:
The DLCI has been configured, but is currently down

Configured, NOT Reported and NOT Active:
The DLCI has not been configured into the Magnum Router, and is waiting for a connection.

In cases where the Magnum Router port has been configured to work as a frame relay network port (supplies all required frame relay information), then all DLCI's for that port will show ***Configured, Reported and Active***. This DOES NOT mean that the DLCI is passing data. It just means that the DLCI is being sent out the selected port.

Display Magnum Utilization

The ***Display Magnum Utilization*** screen gives the ability to show the Magnum Router status in both a text and graphical format. It also has the ability to capture the sampled data to a file (in a comma separated format). The graphical display shows performance in both a BAR chart format and a LINE chart format. This screen does not have the ability to look at independent DLCI's, nor can it clear the Magnum Router counters. For those items, use the ***Display Port Statistics*** (described previously).

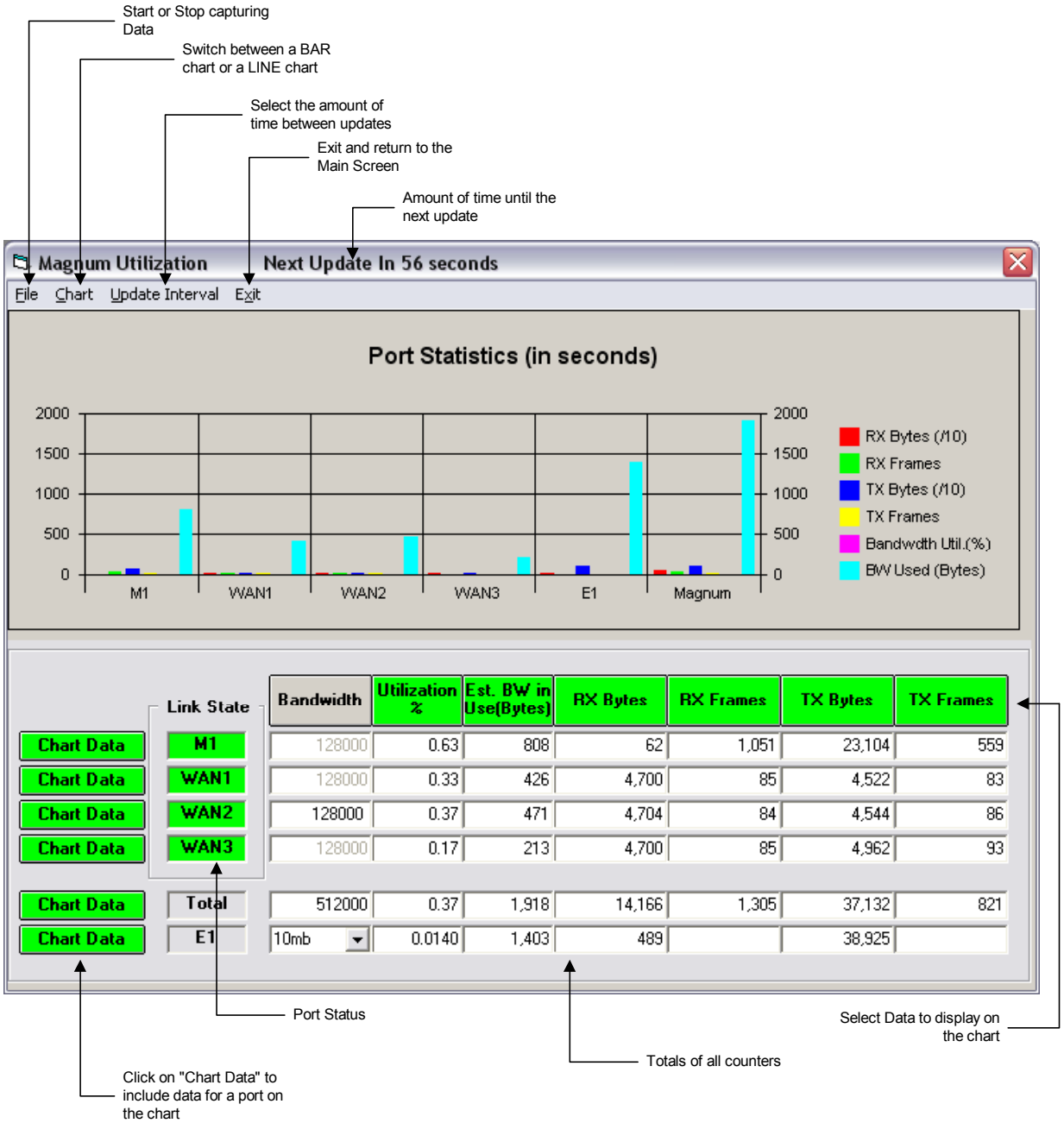


Figure 42 - Magnum Utilization Screen

As can be seen in the previous screen shot, this is a very comprehensive data display that requires some time to actually load and compare all data received. In some cases, it may take several seconds when this function is actually selected before data is displayed.

This screen is broken into 3 sections; The Menu bar, the Chart Section and the Data section.

Menu Bar

Figure 43 - Magnum Utilization Menu Bar

File Menu

The file menu is where to start and stop data capture. Click on the File or press ALT-F and the following menu is displayed.

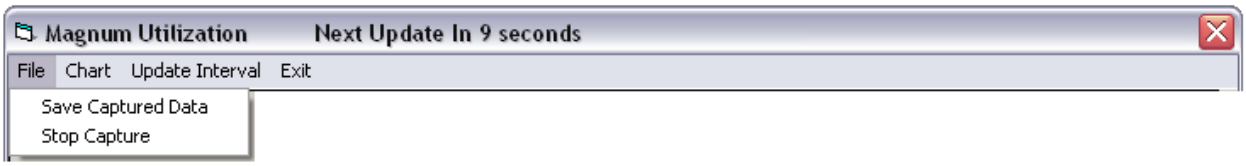


Figure 44 - Magnum Utilization File Menu

Selecting ***Save Captured Data*** will display a file box where the capture file name can be entered.

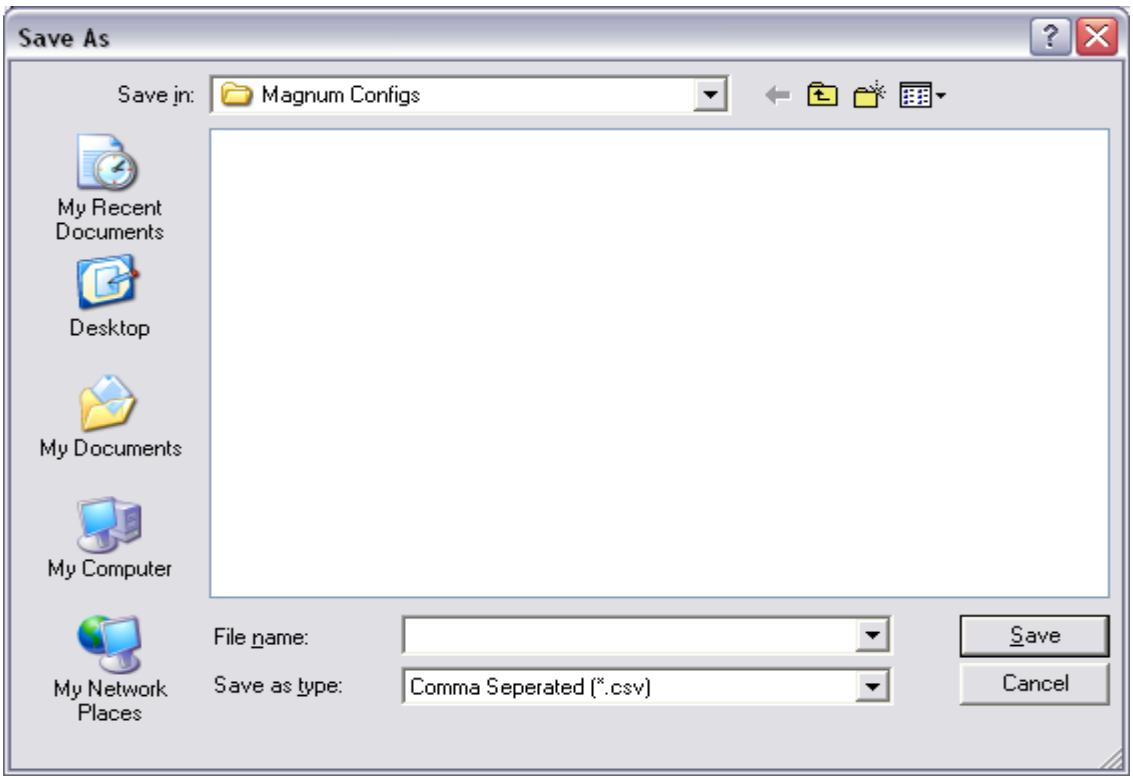


Figure 45 - Magnum Utilization File Save Screen

The captured data is saved in a comma-separated format (.CSV) that can easily be imported into another application such as Excel. Using the captured data, it would then be easy to plot such thing as bandwidth usage over a given amount of time.

Chart Menu

This display supports 2 types of charts supported, BAR and LINE. Clicking on the Chart menu item will display the options for selecting either a BAR chart or a LINE chart.

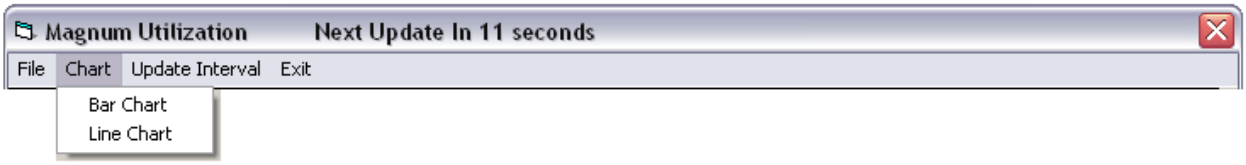


Figure 46 - Magnum Utilization Chart Menu

The differences between these 2 chart types are covered later in this chapter.

Update Interval Menu

This menu item sets the amount of time between updating data to the chart and data grid. Selections include NOW (Immediate Update), 30 seconds, 1 Minute (the default setting), 5 Minutes, 10 Minutes, 15 Minutes, 30 Minutes and 1 Hour.

Figure 47 - Magnum Utilization Update Interval Menu

It is advised that Update Interval times be kept at a value of 1 Minute or greater. The Magnum Router Manager makes several requests for data from the attached Magnum Router during each update. As each request is processed, valuable processing cycles are used. This can have an adverse effect on the overall performance of the Magnum Router. Setting an Update Interval of 30 seconds for a long period of time may not really impact anything, but is could cause the data flow to slowdown.

Exit

Select this menu item to exit this screen and return to the main screen.

Chart Section

Overview

As stated earlier, there are 2 different types of charts allowed in this display; BAR and LINE. The difference between them is the data that can be displayed.

In the case of the BAR chart, all data in the text section can be displayed in a columnar format for each port.

In the LINE chart, only 1 column of data can be displayed at a time for the selected ports.

Port Selection

In the lower section of the display are the *Chart Data* buttons and the corresponding *Port Names* as shows below

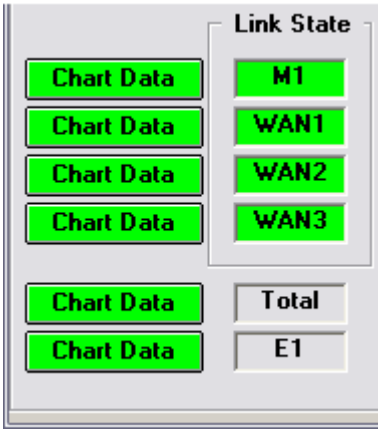


Figure 48 - Magnum Utilization Port Selection

The column to the left selects or de-selects the port to chart. If the *Chart Data* button is green, then it is charted on the graph. The *Link State* column reflects the ports current condition. Green for up and operational, red for down.

Data Selection

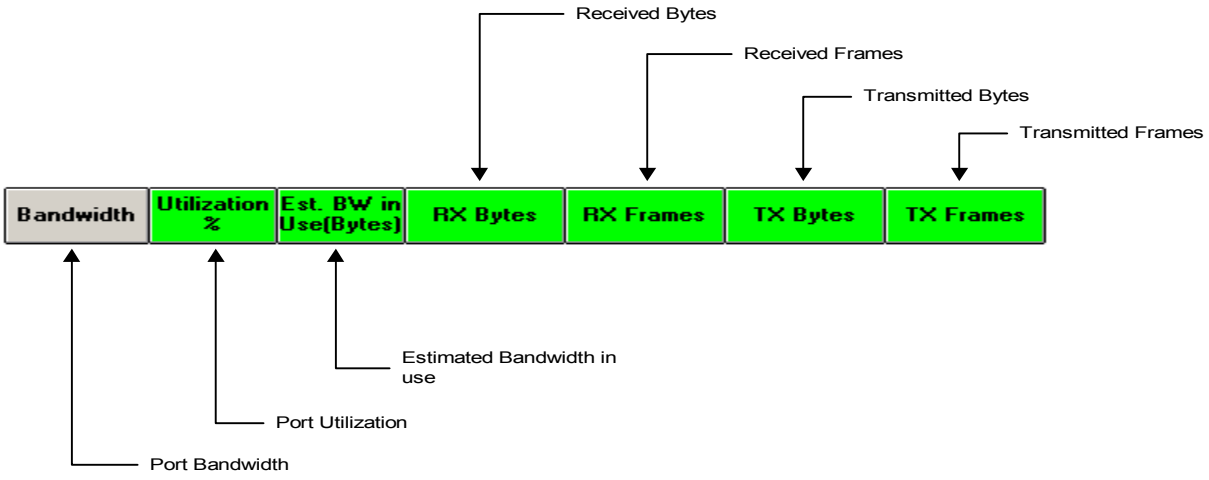


Figure 49 - Magnum Utilization Data Selection Bar

In the BAR chart mode, all data except the BANDWIDTH can be displayed at one time. In the LINE chart mode, only one data column can be displayed at a time.

Selecting which data to chart is the same as selecting which port to chart. Click on the column heading to select or de-select it. A column heading that is green is selected to be on the chart, non-green column headings will not be included in the chart.

Bar Chart

The BAR chart shows all ports selected along with the selected data for each port. Below is a sample of the BAR chart screen.

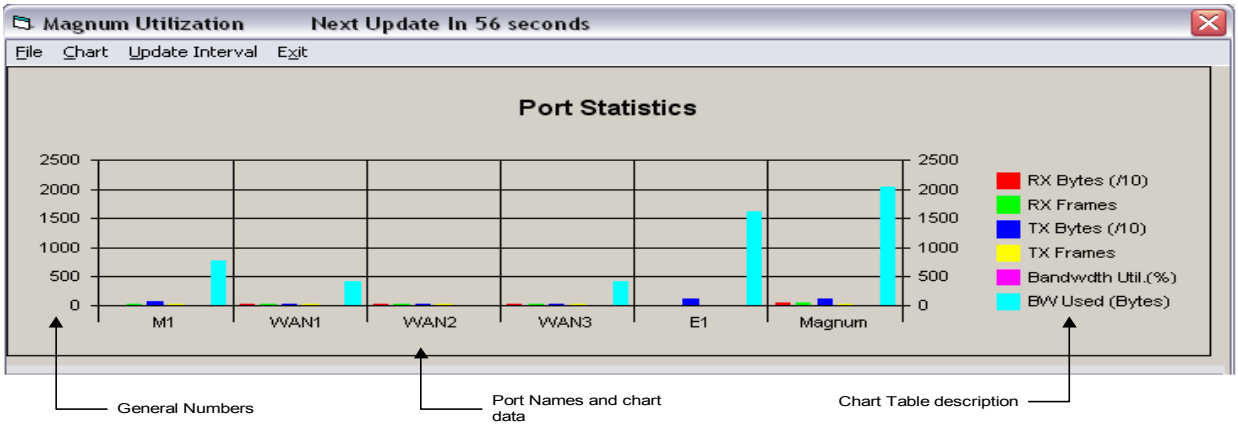


Figure 50 - Magnum Utilization Bar Chart Screen

Line Chart

The LINE chart can show only one column of data for all selected ports. To change the data being displayed on the chart, click on another data column heading. The previous data column will de-select itself and the new selection will be charted.

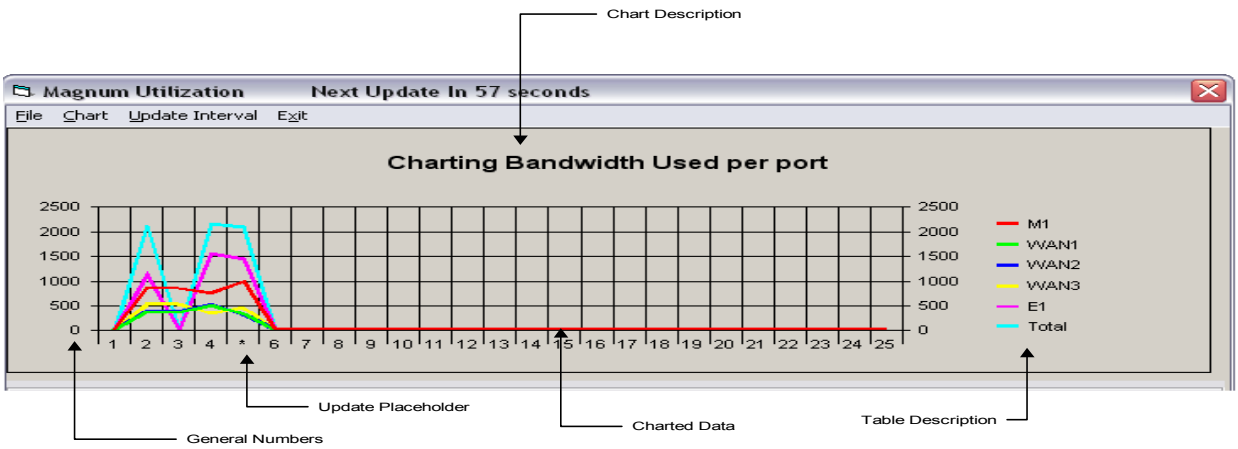


Figure 51 - Magnum Utilization Line Chart Screen

Chart Numbers

On the left side of both the BAR and LINE chart are grid numbers. These numbers reflect a scale from 0 to the maximum number from the charted data.

Data Section

At the bottom of this screen is a text grid that represents the counter totals of each port in the Magnum Router since it was first started, or since the last time the counters were cleared.

Bandwidth	Utilization %	Est. BW in Use(Bytes)	RX Bytes	RX Frames	TX Bytes	TX Frames
128000	1.27	1,628	279,486	6,560	265,898	6,533
128000	0.42	543	62,732	1,048	60,578	1,061
128000	0.42	543	62,302	1,053	61,046	1,058
128000	0.42	543	63,192	1,058	60,182	1,052
512000	0.00	0	467,712	9,719	447,704	9,704
10mb	0.0144	1,442	6,380		446,993	

Port Status Strobe

The ***Port Status Strobe*** is a convenient way to see each WAN port's status from the Main screen. It automatically updates every 60 seconds (non changeable) and can supply snapshot information regarding the port status.

When selected, a check mark is placed next to the ***Port Status Strobe*** menu item. This is used as an indicator as to whether the strobe is active or not. Clicking on the ***Port Status Strobe*** menu item turns the function on of off.

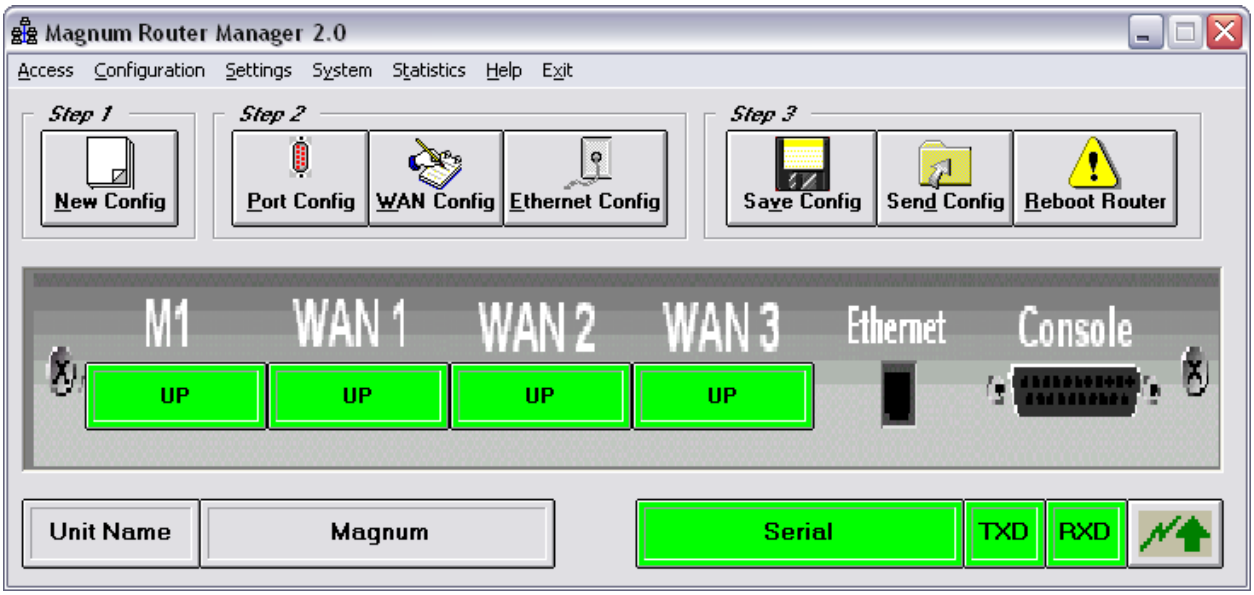


Figure 52 - Port Status Strobe Main Screen

By placing the mouse cursor over one of the status boxes, a line of text appears that represents the current status of the port and it's counters.

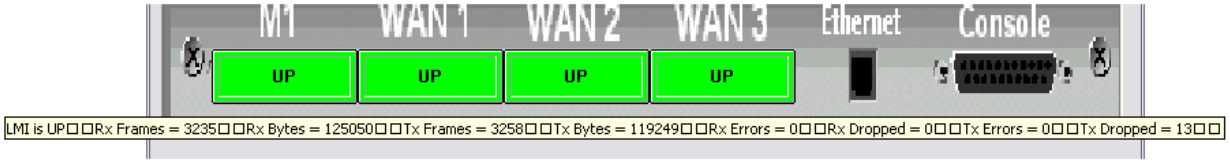

M1
WAN 1
WAN 2
WAN 3
Ethernet
Console
UP
UP
UP
UP
LMI is UP Rx Frames = 3235 Rx Bytes = 125050 Tx Frames = 3258 Tx Bytes = 119249 Rx Errors = 0 Rx Dropped = 0 Tx Errors = 0 Tx Dropped = 13

Figure 53 - Port Status Strobe Quick Stat Screen

By clicking on any one of the status boxes, a snapshot screen will be displayed that gives the same information as putting the mouse cursor over the status box, in a more readable form.

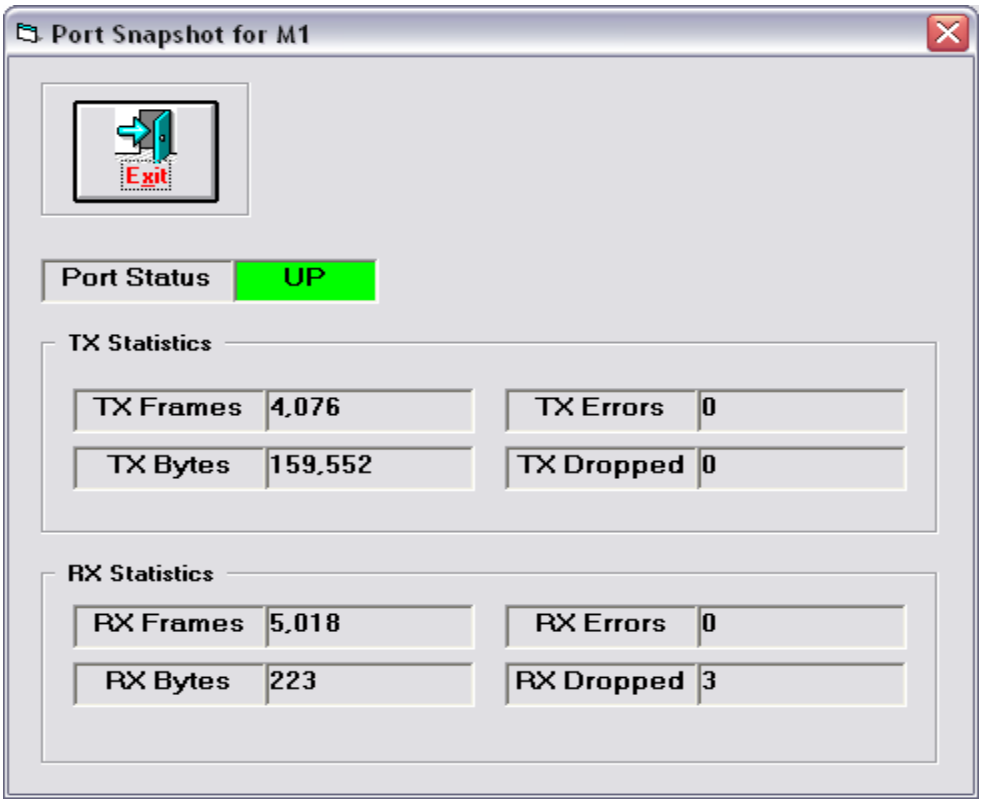
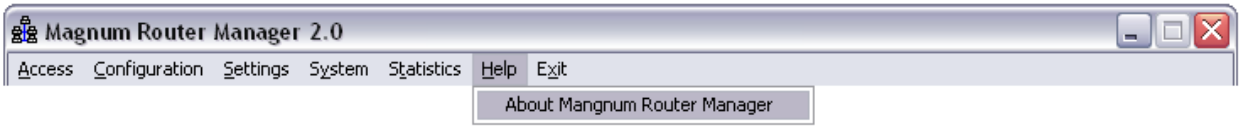


Figure 54 - Port Status Strobe Snapshot Screen

Help Menu Item (ALT-H)



Selecting this item shows the Magnum Router Manager version and miscellaneous information that could be helpful in diagnosing problems.

Exit Menu Item (ALT-X)

Selecting this option closes the Mangum Router Manager program

When exiting the Magnum Router Manager, the loaded configuration (a.k.a working-configuration) is checked to see if there have been any modifications. If there has, a warning message is displayed, and an option to cancel the exit program is offered.

Chapter 8: Magnum Router Specialized Functions

This chapter covers the specialized functions of the Magnum Router. These functions include Virtual Routing of DLCI's, MVoIP (Micro-Band Voice Over IP) and Hybrid RIP routing.

In the case of Virtual Routing and MVoIP, these are proprietary functions and a Magnum Router is required to be at each end-point of a circuit. Hybrid RIP is a special configuration issue that can operate with other brand-x routers, but it's programming is different than programming a normal RIP routing system.

Virtual Routing

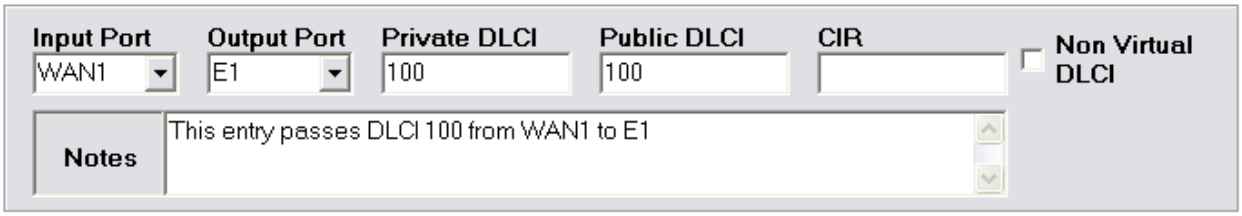
The Magnum Router allows for frame-relay connections in several different ways.

One way is by using a directly connected DLCI. This would be a connection where the input DLCI and output DLCI are the same number.

Direct Connect DLCI's

Networks with only one connection at each end point are also known as direct connect. These PVC's do not need to use virtual routing as all data is running on one DLCI. Thus, the supplied public DLCI would also be the private DLCI.

For example:
If the only traffic that is to be passed through the Magnum Router is IP, then a directly connected DLCI would work. This means that the public DLCI of the Input Port is passed directly to the private DLCI of the Output Port using the same DLCI number for both ports.



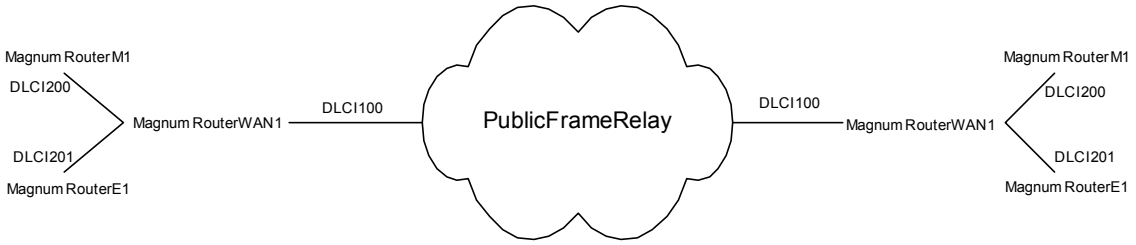
In this example, the public DLCI of 100 is passed directly to the E1 port as DLCI 100.

Virtual DLCI's

The definition of a Virtual DLCI is that it is a single PUBLIC DLCI that is multiplexed into several PRIVATE DLCI's.

If the Frame Relay provider has supplied a circuit with only one DLCI, and multiple connections are required (one for a Marathon and another for Ethernet), then Virtual Routing would be the solution.

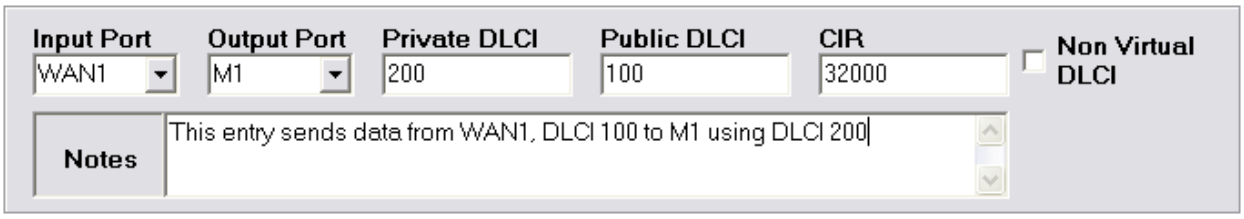
For Example:
Below is a simple diagram that could represent one application that would use a virtual DLCI.



In the above drawing, the PUBLIC Frame Relay circuit is attached to port WAN1, a Marathon is attached to port M1 and the local LAN is attached to port E1. The Public DLCI is 100 on each end, but note that the DLCI's that are connected from the WAN1 port to the M1 and E1 ports are the same on each end of the circuit (DLCI 200 to M1 and 201 to E1). It is an absolute requirement that the private DLCI's be the same on each Magnum Router, or Virtual Routing will not work. Further, the public DLCI cannot be the same as any of the private DLCI's.

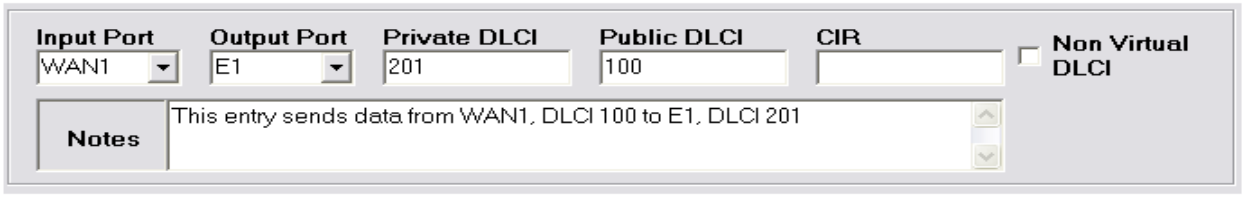
Since one public DLCI is being multiplexed to 2 Magnum Ports (M1 and E1), there is going to be 2 entries in the WAN Configuration screen.

The first entry creates a PVC from the WAN1 port to the M1 port.



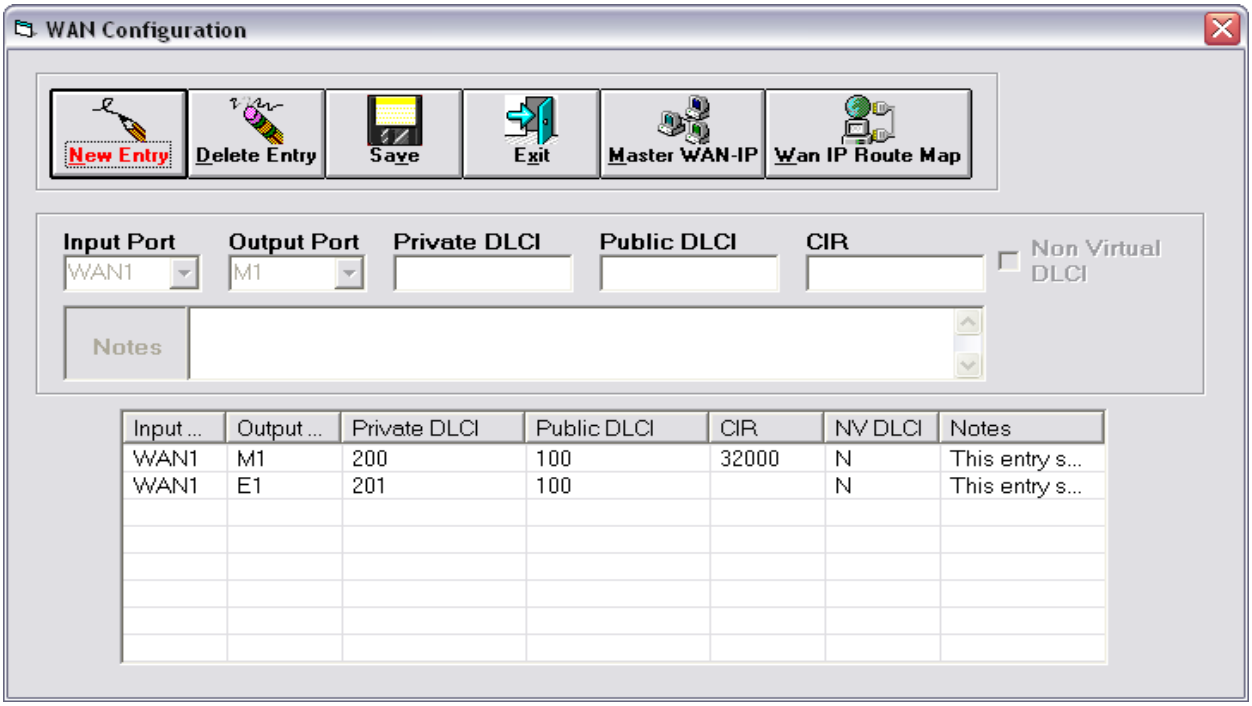
Notice the following: The *Input Port* is WAN1. The *Input Port* is the gathering and splitting point of a virtual DLCI. Further, the *Input Port* is associated with the PUBLIC DLCI (100). Also note that the *Output Port* of M1 will be reporting a DLCI of 200 to the device on M1, in this case a Marathon.

The second entry is similar the first, except that it will create a connection from the WAN1 port to the E1 (Ethernet) port.



Once again, the Input Port of WAN1 will be associated with the PUBLIC DLCI (100), and a DLCI of 201 will be sent to the E1 port. But notice that there is NO CIR. Ethernet does not utilize a CIR for any reason, so none needs to be entered.

The WAN configuration screen would look like this:



What has been accomplished in this example is that the PUBLIC DLCI of 100 now has the capability of sending data from the M1 (Marathon) port and the E1 (Ethernet) port to the remote Magnum Router using a public DLCI of 100.

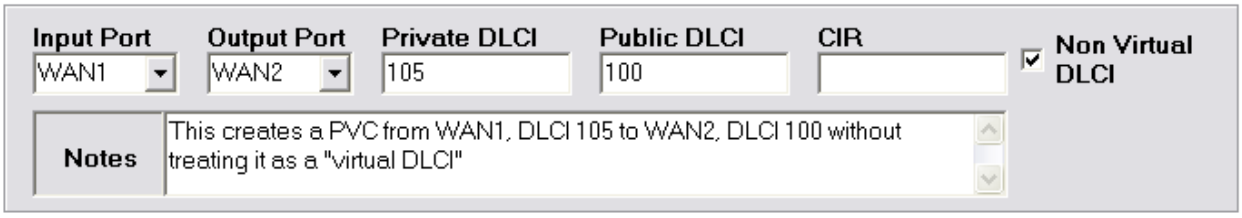
NON-Virtual DLCI's

As noted earlier, the Magnum Router is a Frame Relay switch and an IP router. In some cases, it may be necessary to switch a Frame Relay DLCI from one Magnum Port to another.

The Magnum Router Manager treats WAN Configuration entries differently based on the Input DLCI and Output DLCI. If the Input DLCI is different from the Output DLCI (Input DLCI 100, Output DLCI 200 for example), then the Magnum Router Manager assumes that the entry is going to be used as a virtual DLCI. However, this may not be the case. Clicking the ***Non-Virtual DLCI*** box informs the Magnum Router Manager that this entry is to be treated as a switched PVC, or just pass data from DLCI 100 to DLCI 200.

For Example:
There is a supplied public DLCI of 100 on WAN1 and the attached FRAD on port WAN2 absolutely needs a DLCI of 105, although this would be a rare case, the Magnum Router Manager handles this by the Non Virtual DLCI checkbox.

This is what the above example would look like:



This utilizes the frame switching capabilities of the Magnum Router by directing traffic from the PUBLIC DLCI of 100 to the PRIVATE DLCI of 105 and vice versa.

A PUBLIC DLCI cannot be both a virtual DLCI and a “direct connect” DLCI at the same time.

Micro-Band Voice Over IP

Micro band Voice over IP is the Magnum Routers unique ability to encapsulate all Frame-Relay data, including Marathon legacy data and voice, into IP packets and cause them to traverse any IP network, including the public Internet.

MVoIP means that existing Micom Marathons that use dedicated leased lines or public frame relay circuits can now be deployed for use over the Internet, VPN’s or corporate WAN networks that utilize IP.

Programming the Magnum Router to use MVoIP is an easy task so long as a few simple steps are followed:

- A WAN Configuration entry that connects one of the Magnum Router WAN ports to the Ethernet port using a DLCI from 900 to 989
- A WAN IP Route entry
- Two available IP addresses
    - One for the Ethernet port of the Magnum Router
    - One as the Source IP address in the MVoIP screen

As noted, the MVoIP uses a DLCI from 900 through 989. This does not mean that those DLCI’s are exclusive to MVoIP only. The Magnum Router looks at all connections in the WAN connection table, only DLCI’s from 900 through 989 with a connection to the E1 port are automatically considered to be MVoIP connections. The DLCI’s 900 through 989 can also be used for standard WAN DLCI’s to the carrier network, but cannot be in both places at the same time.

MVoIP uses a UDP transfer protocol that uses a port number that is 60000 + the DLCI number being used. Thus, a MVoIP connection that uses DLCI 900 would have a UDP port of 60900. If the Magnum Router is behind a firewall, proxy server or some other security device then it important that the port being used by the MVoIP be opened in both directions.

Another important item to note is that the MVoIP causes the Magnum Router to act like any other IP host device on a network, and is then subject to LAN traffic problems that may arise. These can cause several different problems, depending on the configuration, that include voice choppiness and data slowdown.

Running the MVoIP over a slower link speed, such as a 128k DSL line, can also cause voice and data problems due to the limited bandwidth and demands of the end users. If the MVoIP is to be deployed across the Internet, it is advised that the uplink and downlink speeds of both sites be at least 384k or higher.

There is an MVoIP sample in chapter 9 that will assist in clarifying the programming requirements and steps.

RIP Routing

RIP (Routing Information Protocol) is implemented on the Magnum Router using a “hybrid” approach. Where most routers do RIP routing in a seamless fashion (just enable RIP and the router does the rest), the Magnum Router needs to have a combination of static routes to control the WAN portion of the network, along with the RIP protocol running on the Ethernet port to update routing tables at remote sites.

The Magnum Router sends routing table updates out all programmed ports, and can learn routing information through these ports. The Ethernet port of the Magnum Router uses this information in the same way as any other RIP router, but the WAN section of the Magnum Router cannot use the learned information.

As new sites come up on the network, they need to be programmed into the WAN section of the Magnum Router in order to become available to other networks and devices. Once entered and learned, the Ethernet port of the Magnum Router will send routing table updates to the other network segments, just like any other RIP router.

Thus, this combination of static routes for the WAN and dynamic routing table updates for the Ethernet is what is considered a hybrid implementation.

The Magnum Router uses a RIP version 1 protocol, and cannot support version 2 or any other dynamic routing protocols.

In chapter 9, there is a sample of a point-to-point and multi-point RIP network.

Chapter 9: Sample Configurations

This chapter describes sample configurations available as files on the Magnum Router Manager CD distributed with the Magnum Router Module. The configurations are some of the most common and useful applications for the Magnum Router Module. You can, if you choose, devise many other configurations, and use any of the sample configurations as a starting point.
See chapter 7 for instructions on opening configuration files from disk.

The following types of configurations are discussed.

Sample 1 - Dedicated Point-to-Point Network
Sample file names:
Dedicated Point-to-Point-A.CF2
Dedicated Point-to-Point-B.CF2

Sample 2 - Public Point-to-Point Frame Relay Network
Sample file names:
Public Point-to-point FRAME-A.CF2
Public Point-to-point FRAME-B.CF2

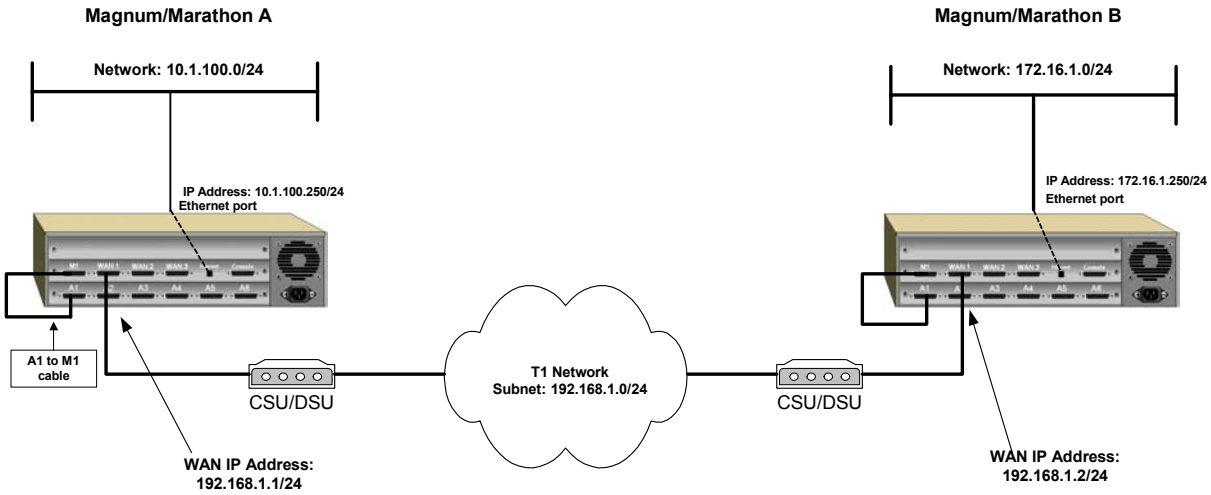
Sample 3 - Public Multipoint Frame Relay Network
Sample file names:
Multi-Point Public FRAME-A.CF2
Multi-Point Public FRAME-B.CF2
Multi-Point Public FRAME-C.CF2

Sample 4 - MicroBand VoIP (MVoIP)
Sample file names:
MVOIP-A.CF2
MVOIP-B.CF2

Sample 5 - RIP Routing Point-to-Point
Sample file names:
RIP Point-to-Point-A.CF2
RIP Point-to-Point-B.CF2

Sample 6 - DHCP Server
Sample file name:
DHCP-Host.CF2

Sample 1 - Dedicated Point to Point Network



In this example, 2 Magnum Routers are connected via a standard DDS carrier connection. The actual connection from the carrier will supply all the synchronizing clock information, so the Mangum Routers must supply any Frame Relay information.

Since the carrier will supply the clocking, this means that the WAN1 ports on both Magnum Routers will need to be set to DTE (accept clock). The Frame Relay configuration is a little different. As described in chapter 7, there are several “Link Types” available. In this case, DEDICATED_MASTER and DEDICATED_SLAVE will be used.

The WAN1/DEDICATED_MASTER side (Magnum A) will act as a Frame Relay NETWORK port, supplying LMI and DLCI information to any devices attached to it, in this case the remote site.

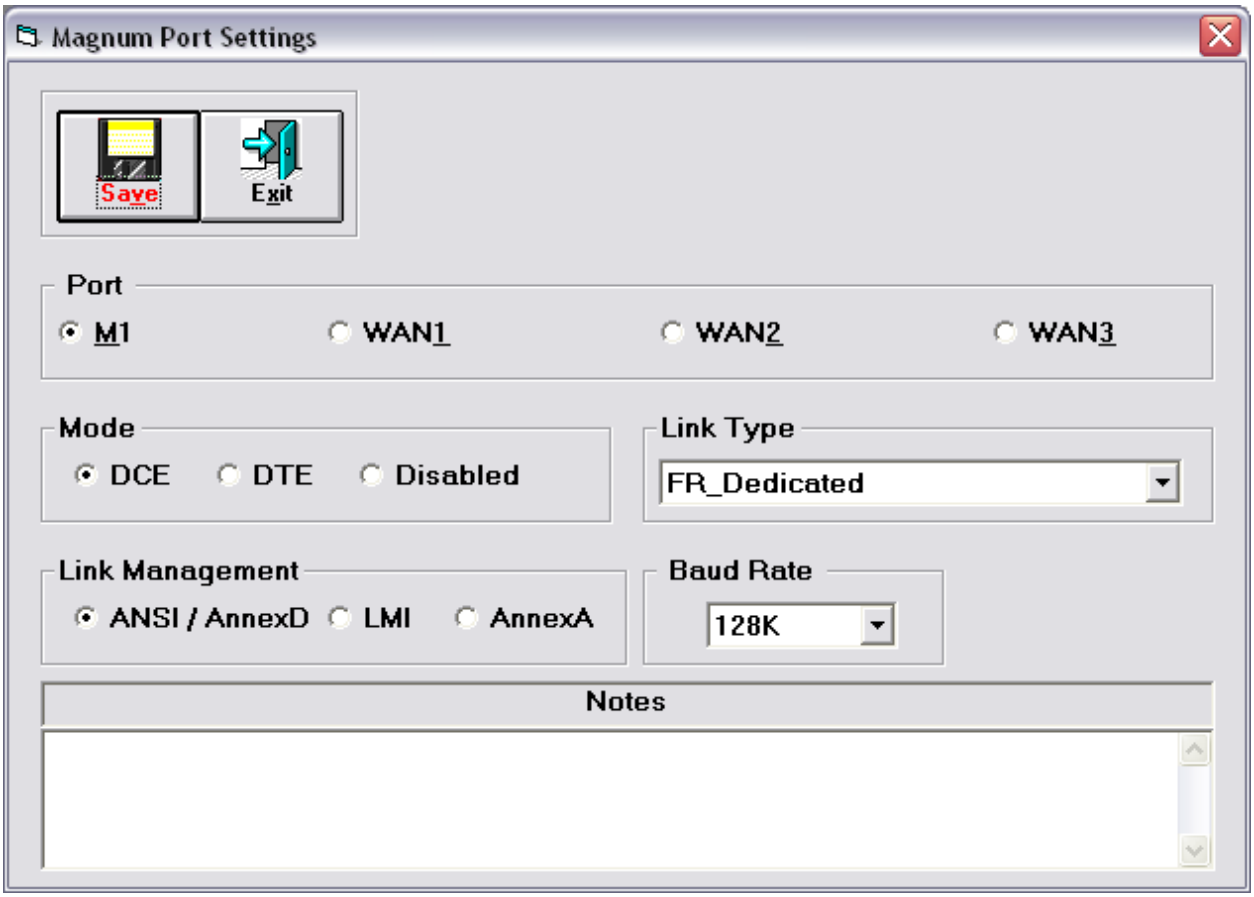
The WAN1/DEDICATED_SLAVE side (Magnum B) will accept LMI and DLCI information just as if it was connected to an actual Frame Relay carrier line. This would make it a Frame Relay USER port.

Configuration Files used in this example:
Dedicated Point-to-Point-A.CF2 – This will be the Frame Relay NETWORK port side
Dedicated Point-to-Point-B.CF2 – This will be the Frame Relay USER port side

Begin by starting the Magnum Router Manager, and optionally logging onto a Magnum Router. Remember that the Magnum Router Manager DOES NOT have to be connected to a Magnum Router in order to create or edit a configuration.

Below are several screen shots of the Magnum-A and Magnum-B's configuration.

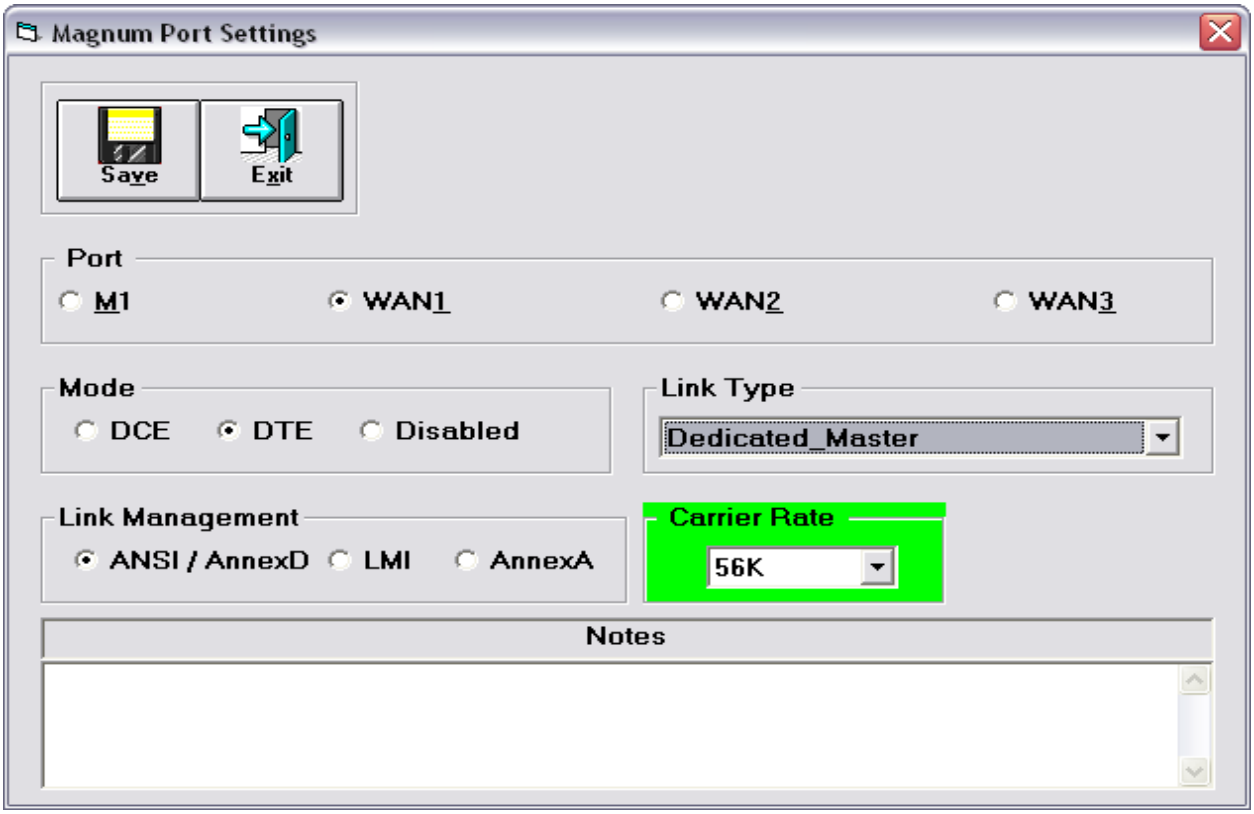
M1 Port Settings for both Magnum A and Magnum B



Here, the M1 port is configured to act as a Frame Relay NETWORK port (FR_Dedicated), but to also act as a synchronizing port as well thus is it set for DCE. This means that the M1 port will supply a clocking source of 128k for the attached Marathon.

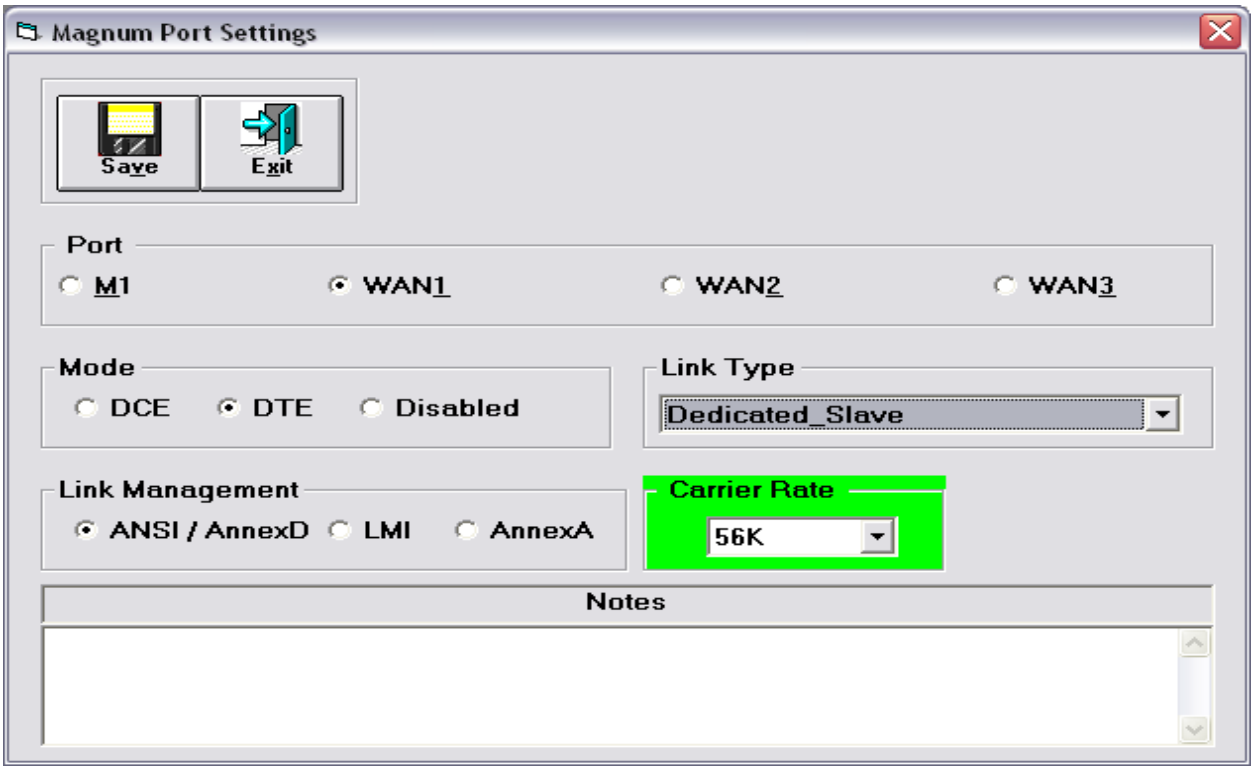
WAN1 Port Settings for Magnum A

Notice that the WAN1 port is set for DTE and the Link Type is set for DEDICATED_MASTER. As described above, this is the Frame Relay NETWORK port side. Also note that the Baud Rate box that was present for the M1 port has been replaced by a Carrier Rate box. This would be in external clock being supplied by the attached CSU/DSU, in this example 56k.



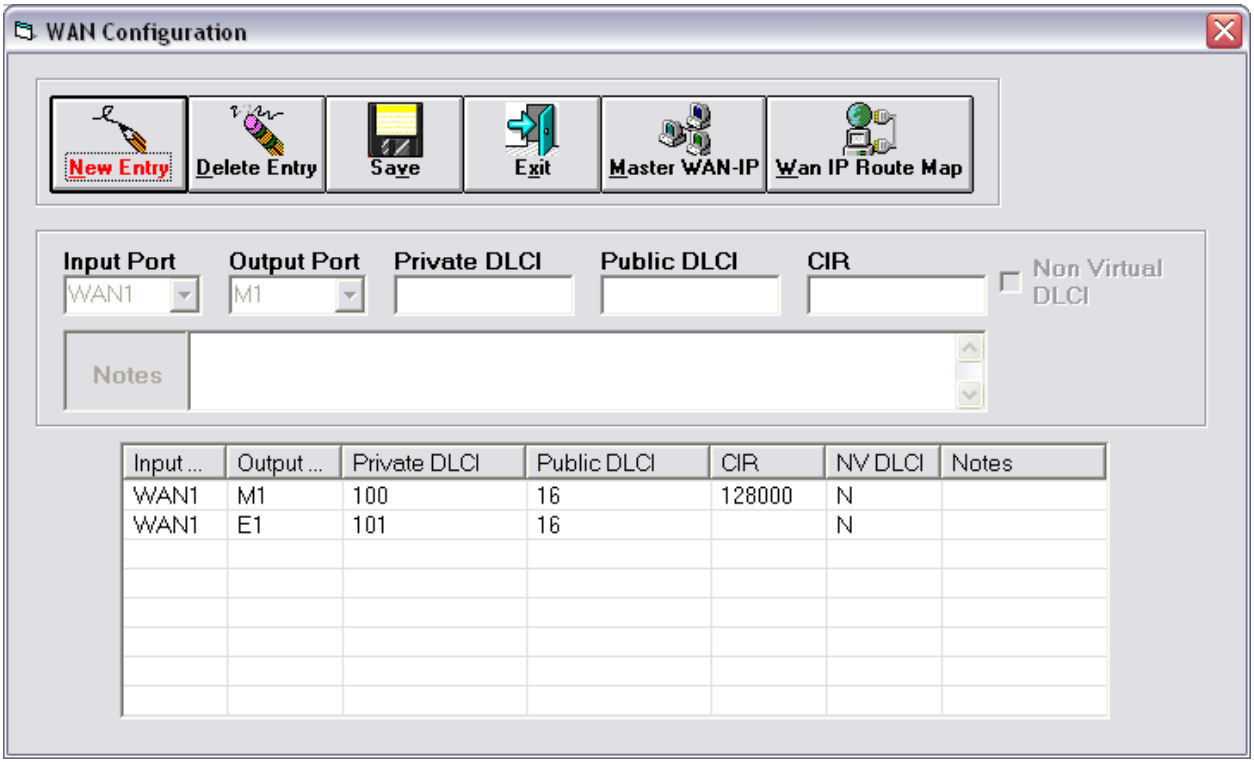
WAN1 Port Settings for Magnum B

Notice that the WAN1 port is set for DTE and the Link Type is set for DEDICATED_SLAVE. As described above, this is the Frame Relay USER port side.

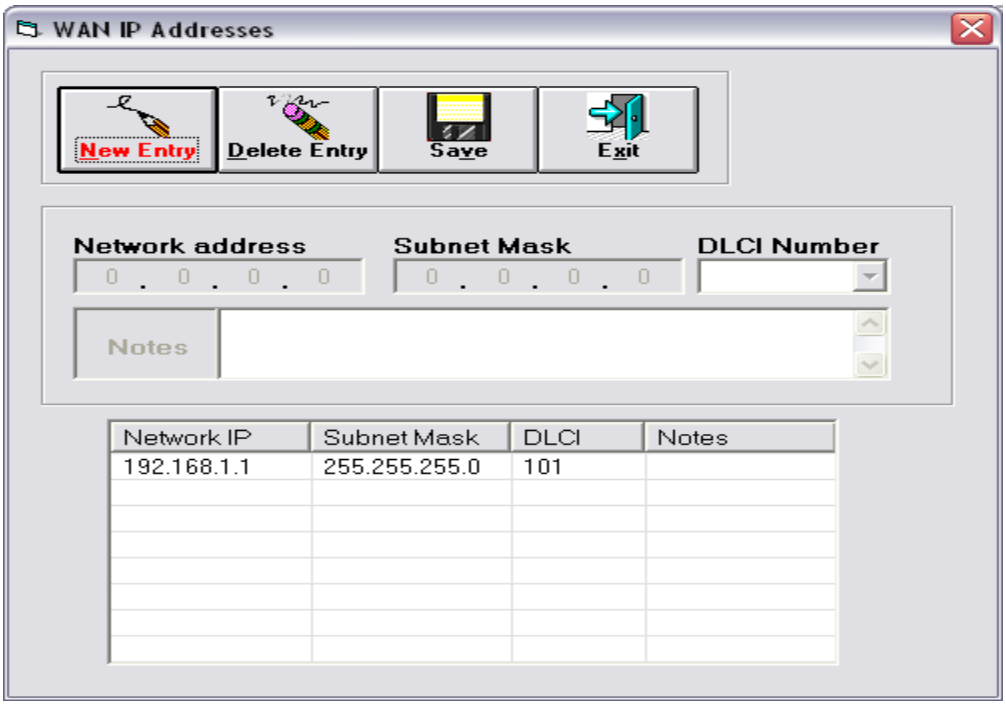


WAN Configuration for Magnum A and Magnum B

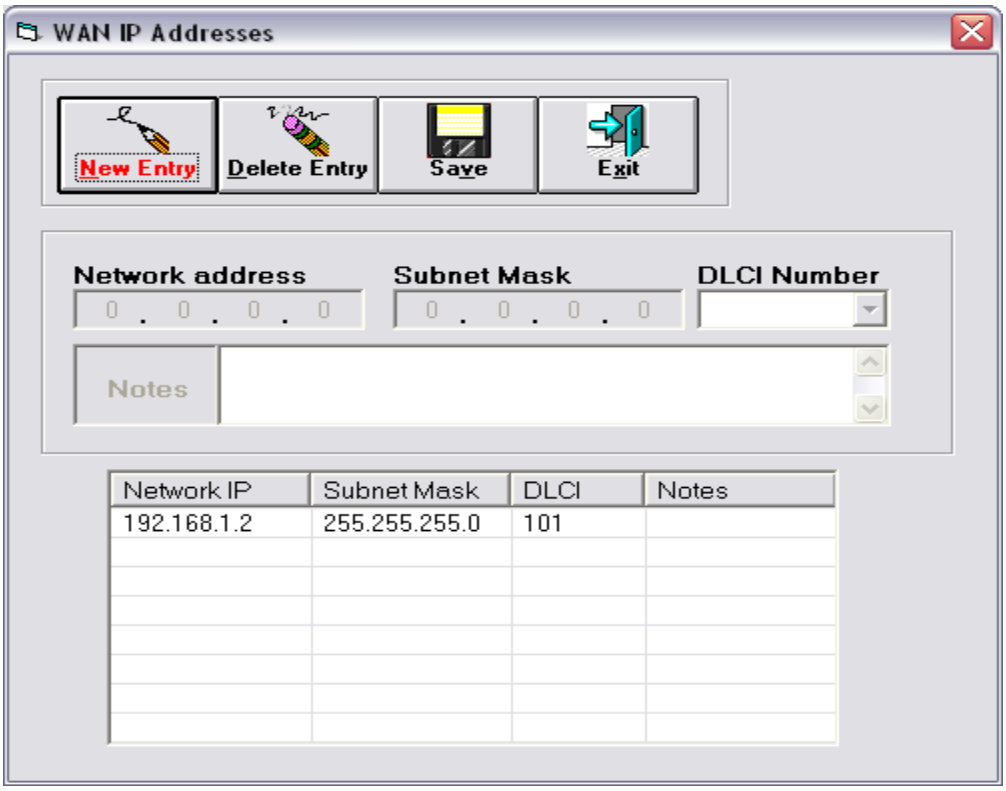
In the above diagram, the main connection between the two sites is a standard DDS line supplied by a carrier. The speed of this line can be anywhere from 9.6k through 2.048m. However this line only supplied clocking information. The Magnum Router must then act as a Frame Relay switch and Frame Relay NETWORK or USER port. In essence, the Magnum Routers will become their own Frame Relay network. This means that PVC's must be created and maintained. PVC connections are covered in more detail in chapter 7. In this example, a Virtual DLCI is being utilized to send data to the M1 and E1 ports.



Master WAN IP Address for Magnum A
The following table shows the Master WAN IP Address screen for Magnum A.



Master WAN IP Address for Magnum B
The following table shows the Master WAN IP Address screen for Magnum B.



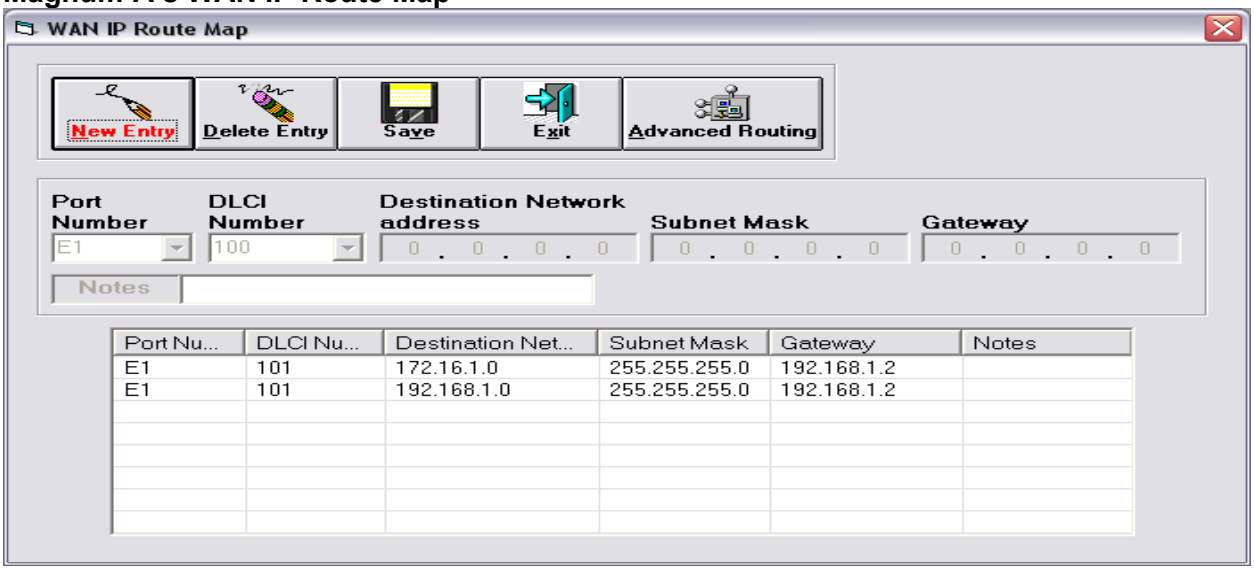
Just like any brand-x router, in order to route IP traffic, there must be an IP address on the WAN port.

WAN-IP Route Map

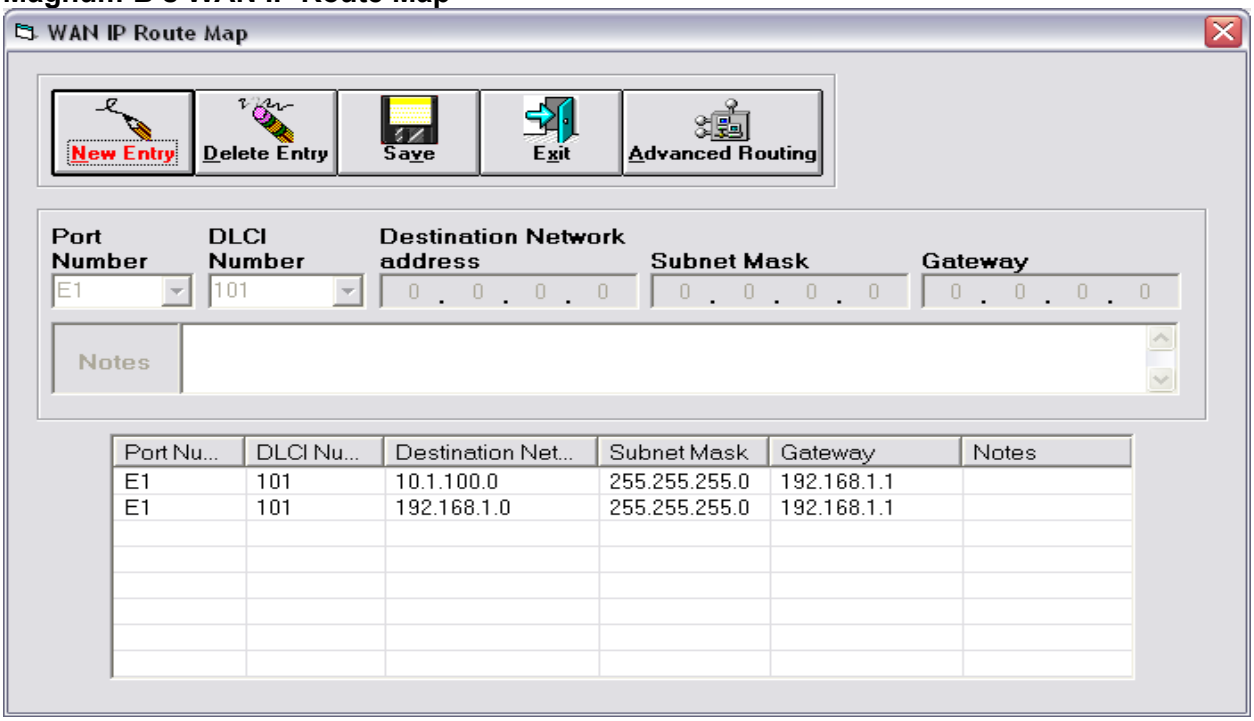
Here, the actual routing commands are created to allow Ethernet traffic to flow from Magnum-A to Magnum-B.

See Chapter 7 for detailed information on using the Magnum Router Manager to change data in the WAN IP Route Map Table.

Magnum-A's WAN IP Route Map



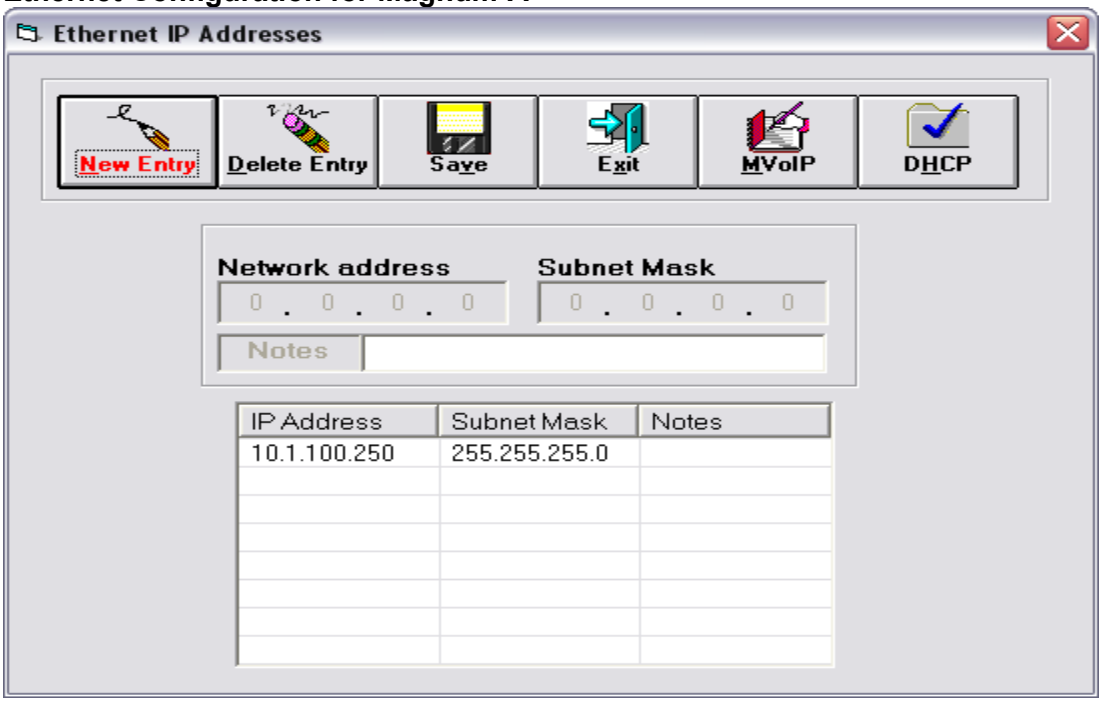
Magnum-B's WAN IP Route Map



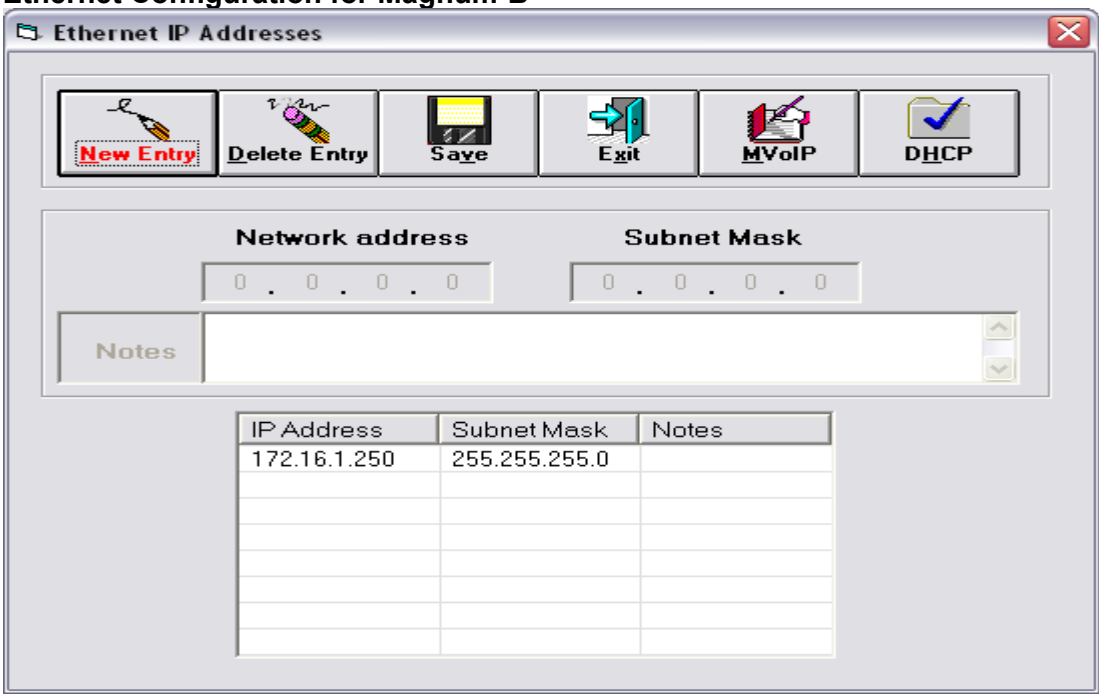
Ethernet Configuration

The following window illustrates the Ethernet Configuration associated with this sample configuration.

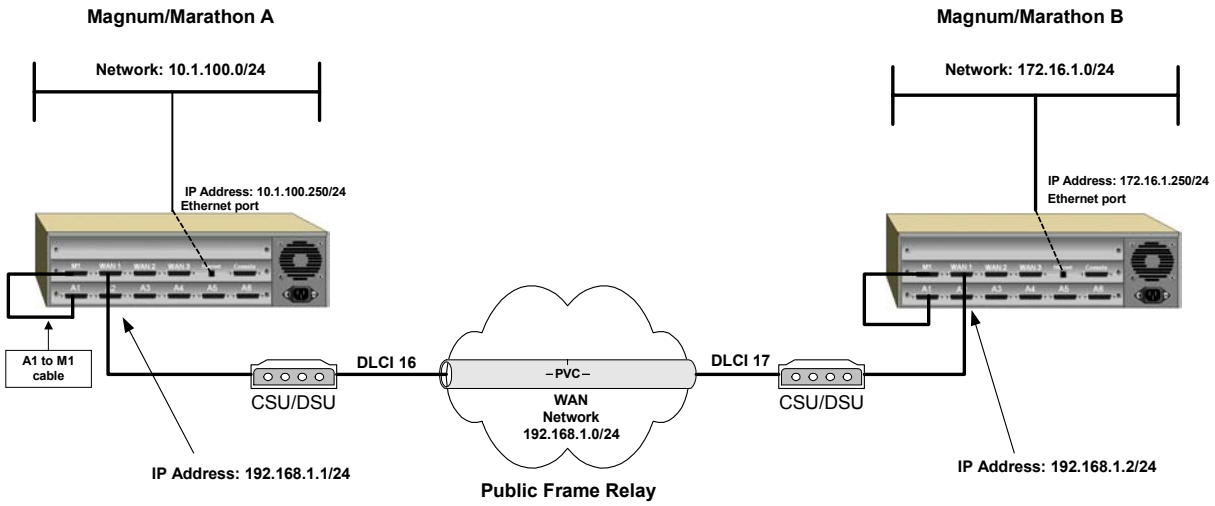
Ethernet Configuration for Magnum-A



Ethernet Configuration for Magnum-B



Sample 2 - Point to Point Public Frame Relay Network

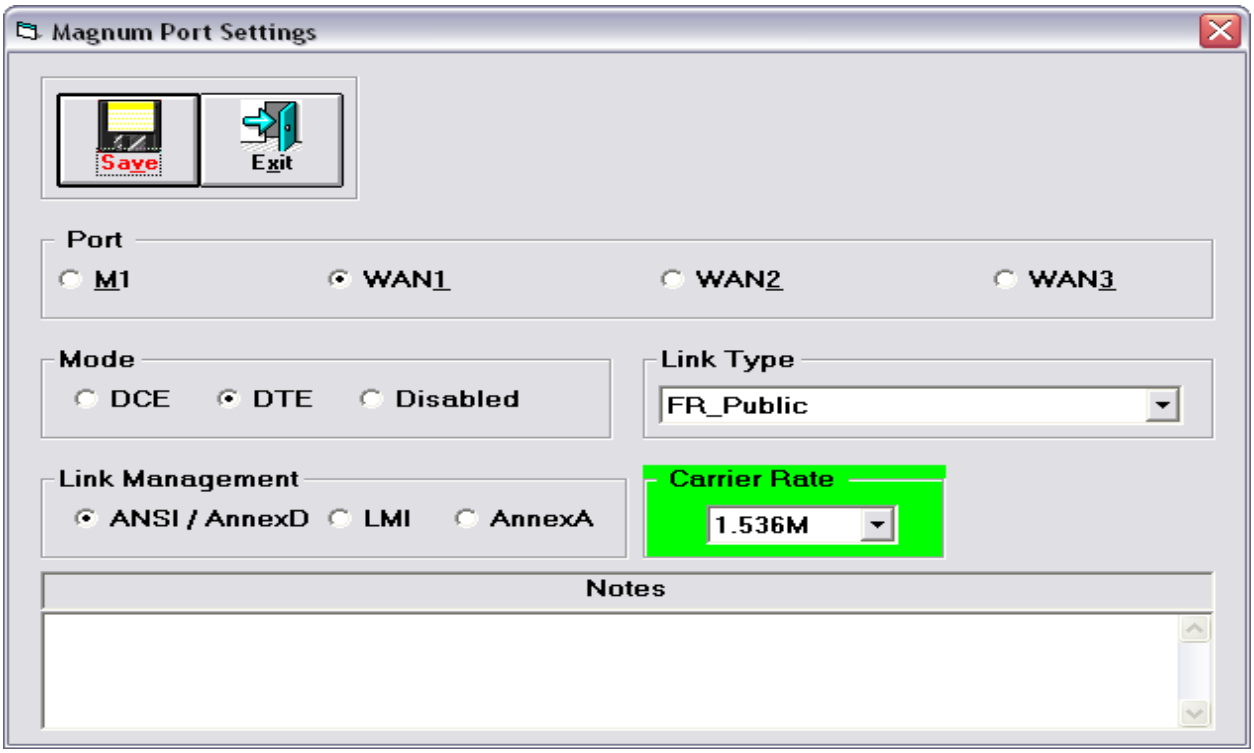


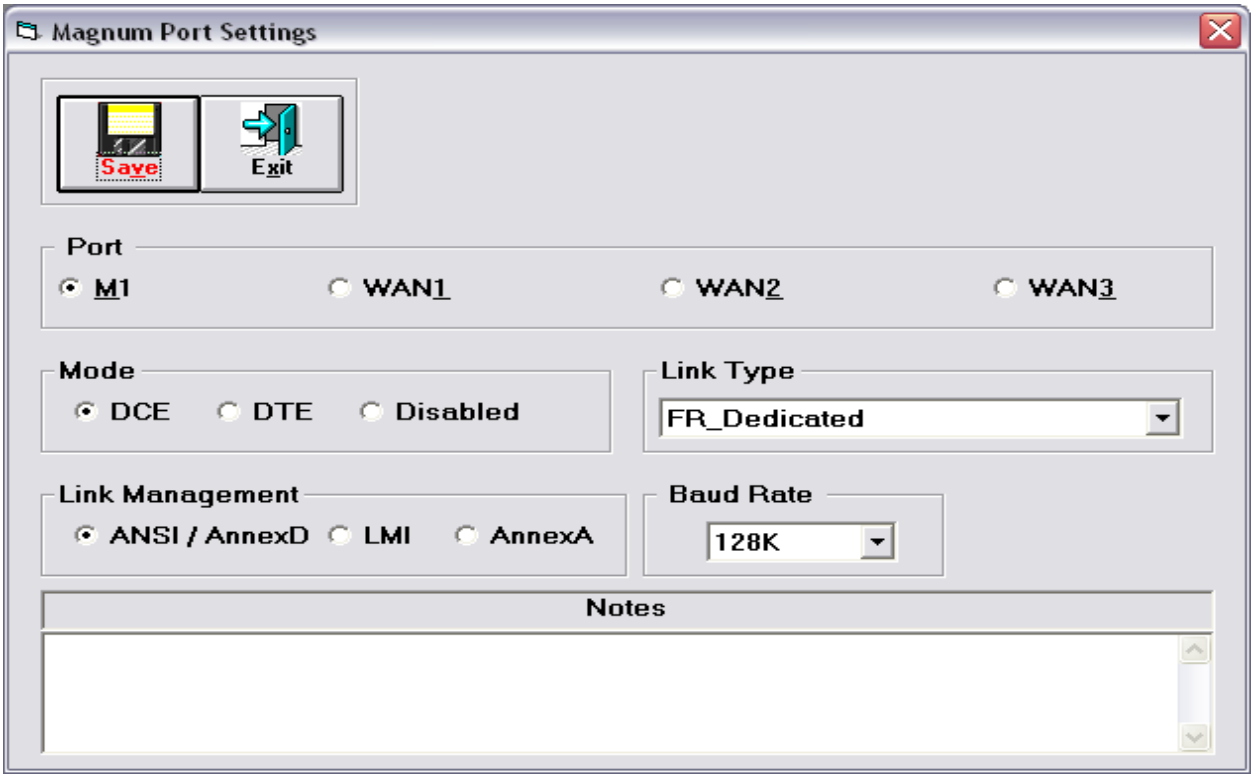
Although this sample is very similar to SAMPLE 1, there is one important difference. This time the carrier is supplying the clocking **and** Frame Relay information. This means that the WAN1 ports on both Magnum Router's will need to be set-up as a Frame Relay USER (FR_Public) port.

Configuration File used in this example:
Public Point-to-point FRAME-A.CF2
Public Point-to-point FRAME-B.CF2

M1 and WAN1 settings on Magnum-A and Magnum-B

In this sample, the port settings of Magnum-A and Magnum-B are identical.

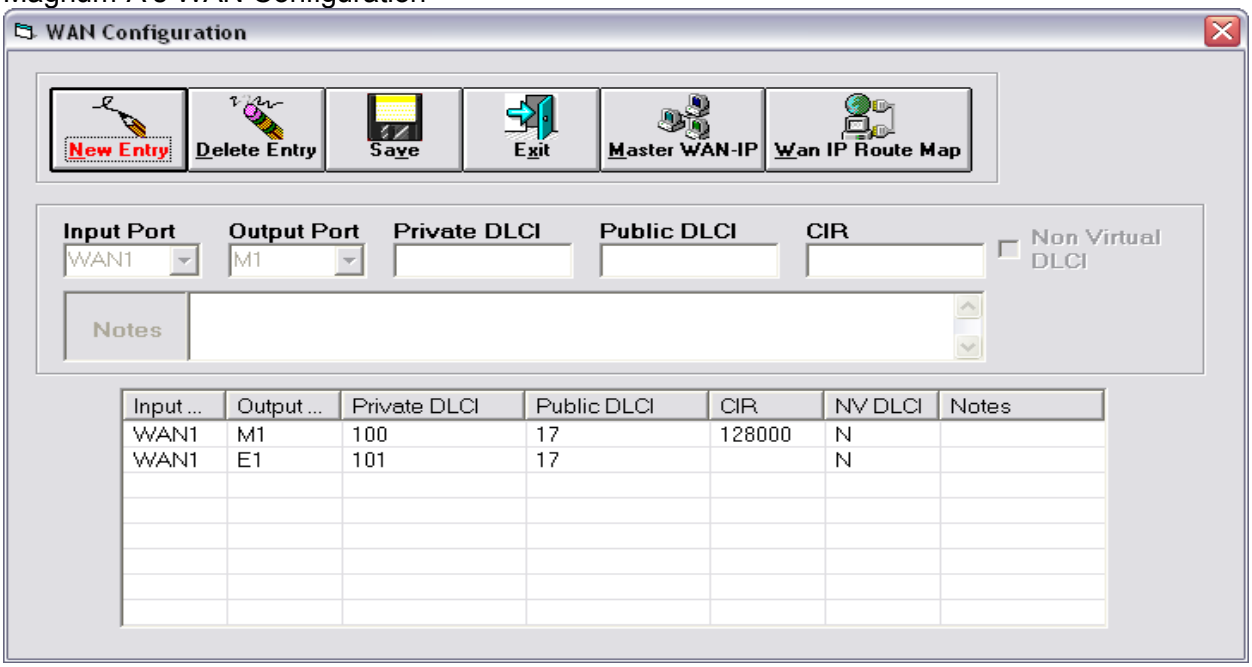




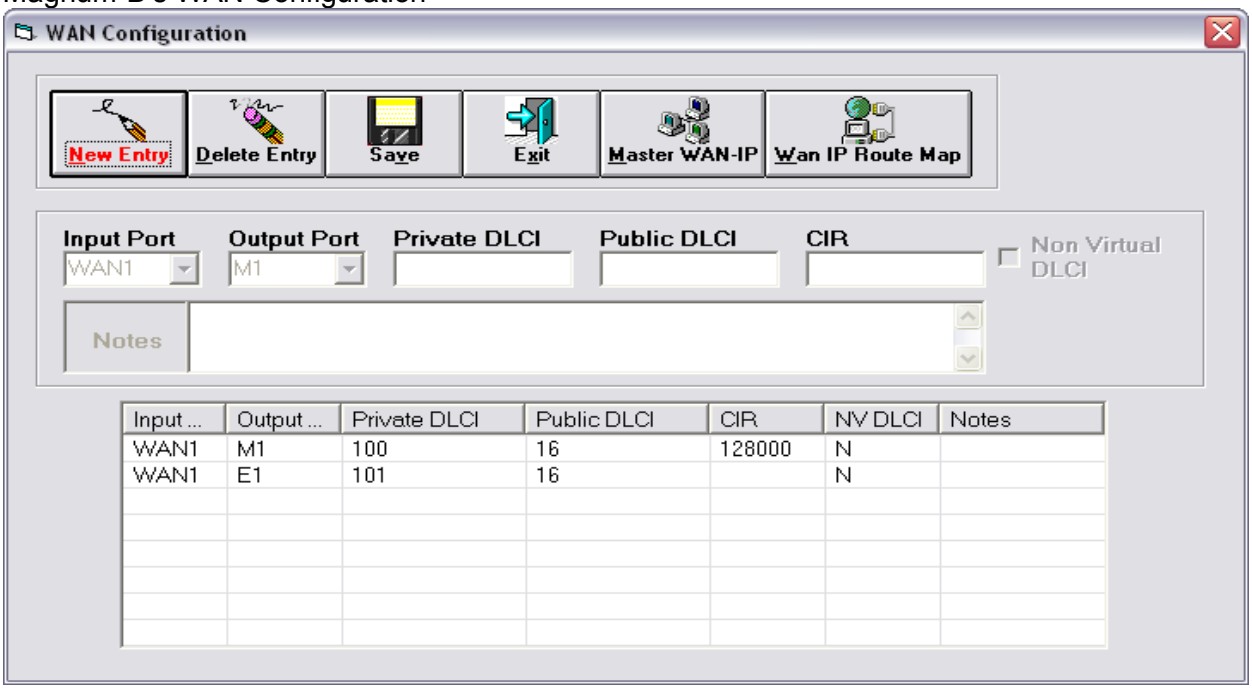
WAN Configuration

In the diagram for this example, Magnum-A is being supplied with a DLCI of 16 from the carrier, and Magnum-B is being supplied with a DLCI of 17. Once again, a Virtual DLCI is being utilized to split one DLCI into 2 DLCI's. The only difference between Magnum-A and Magnum-B is the PUBLIC DLCI.

Magnum-A's WAN Configuration



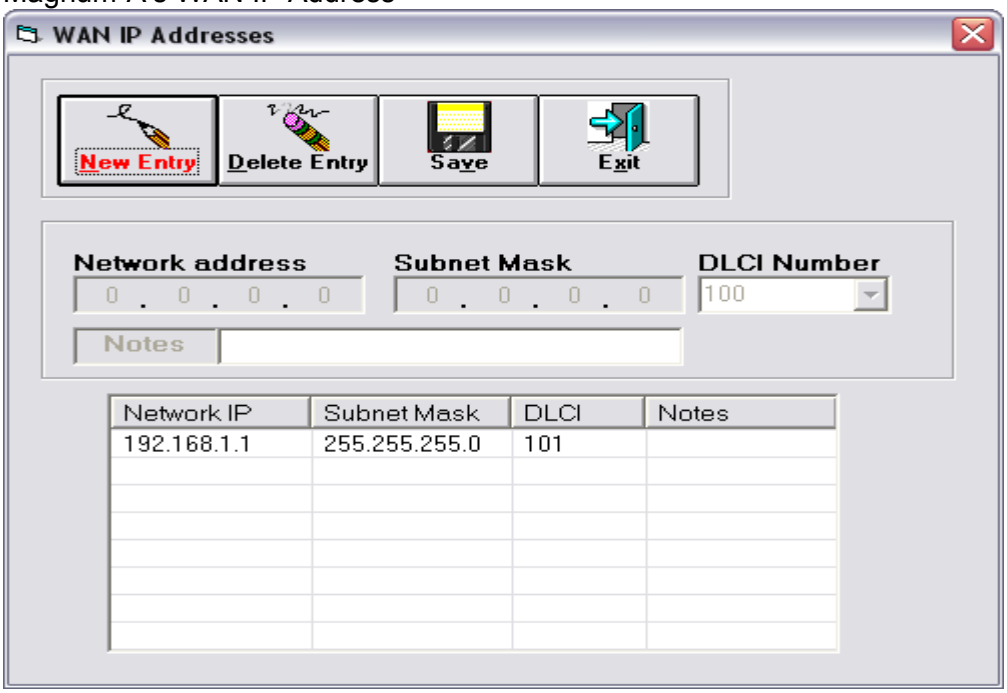
Magnum-B's WAN Configuration



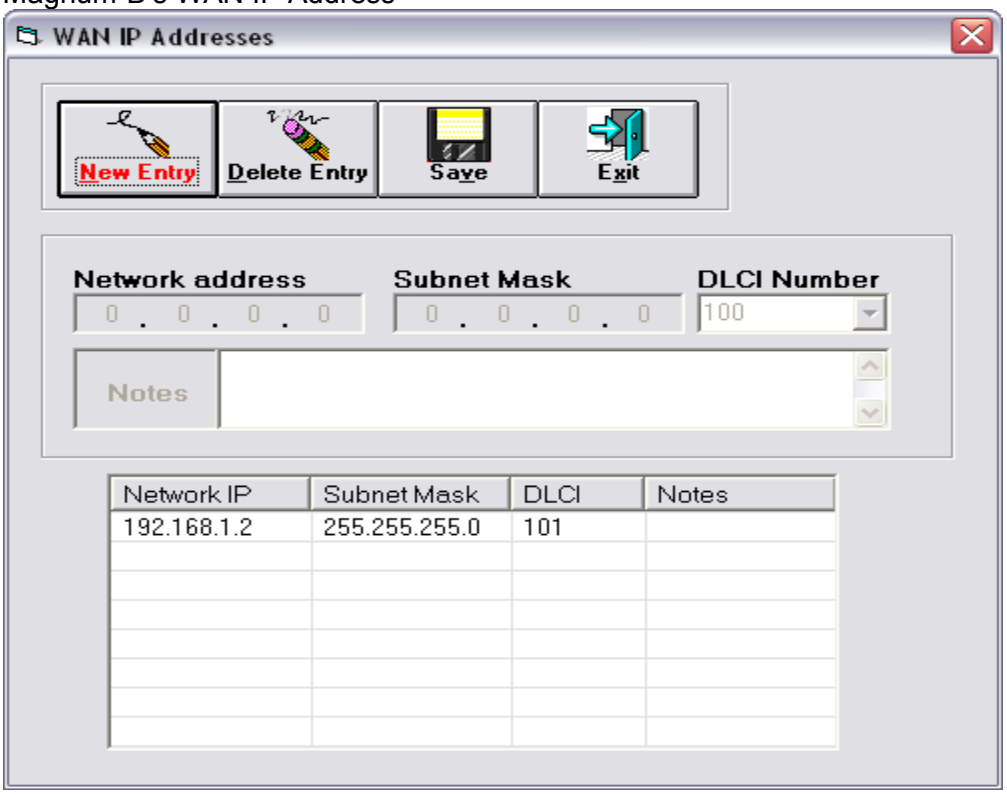
Master WAN IP Address

As in the previous sample, and IP address needs to be assigned to the WAN port for IP routing to function across the Frame Relay network.

Magnum-A's WAN IP Address

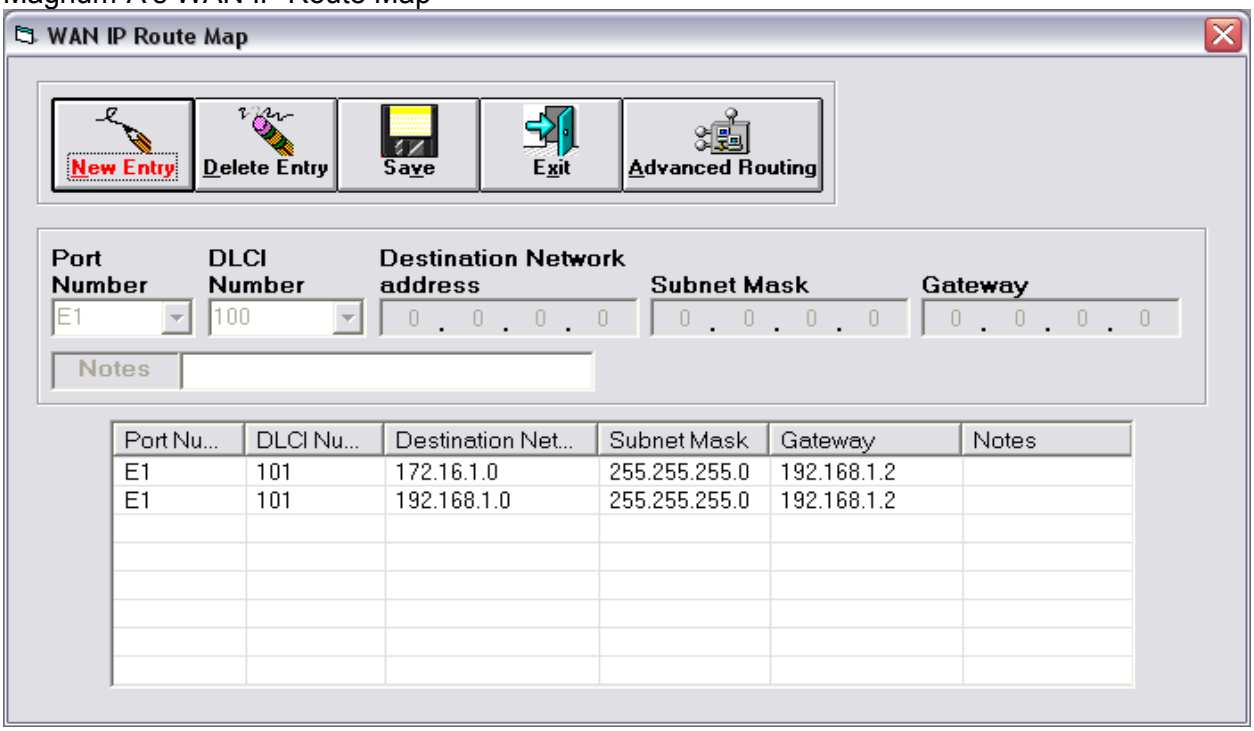


Magnum-B's WAN IP Address

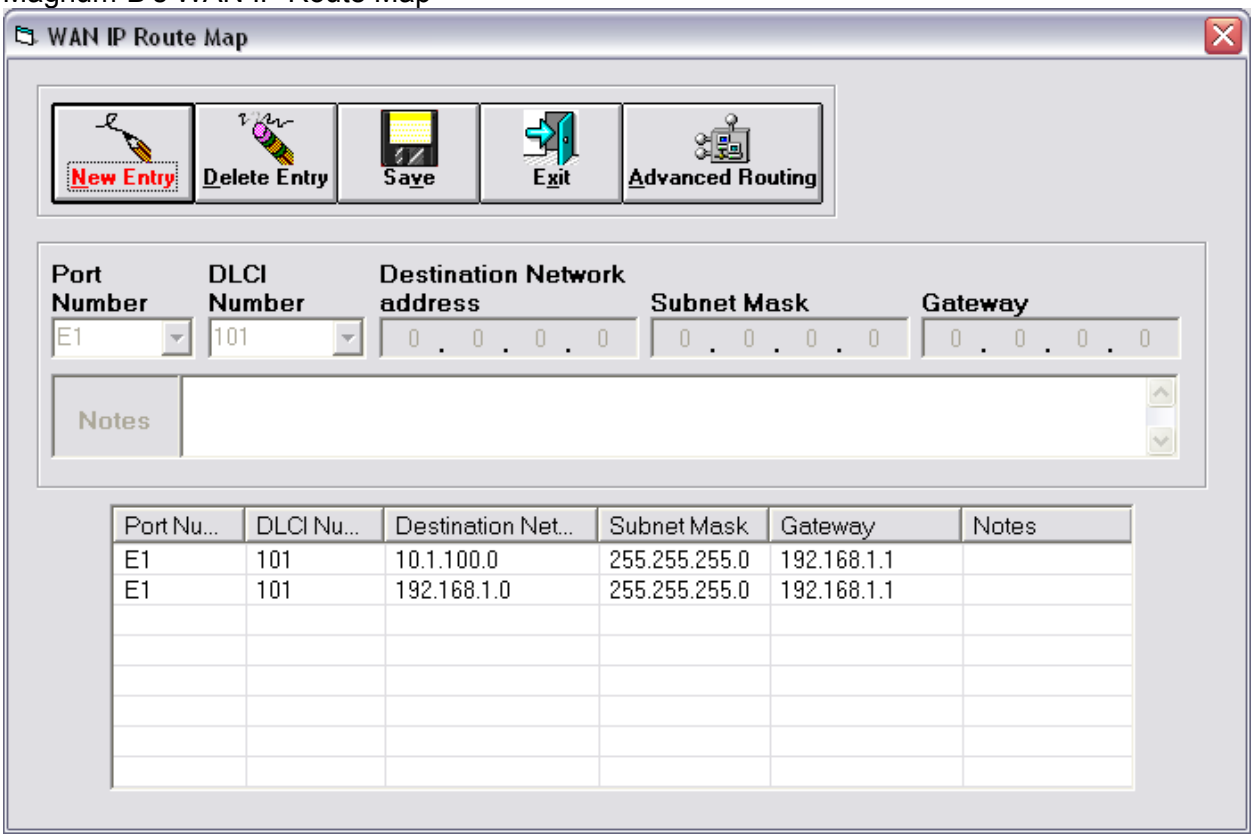


WAN IP Route Map Table

Magnum-A's WAN IP Route Map

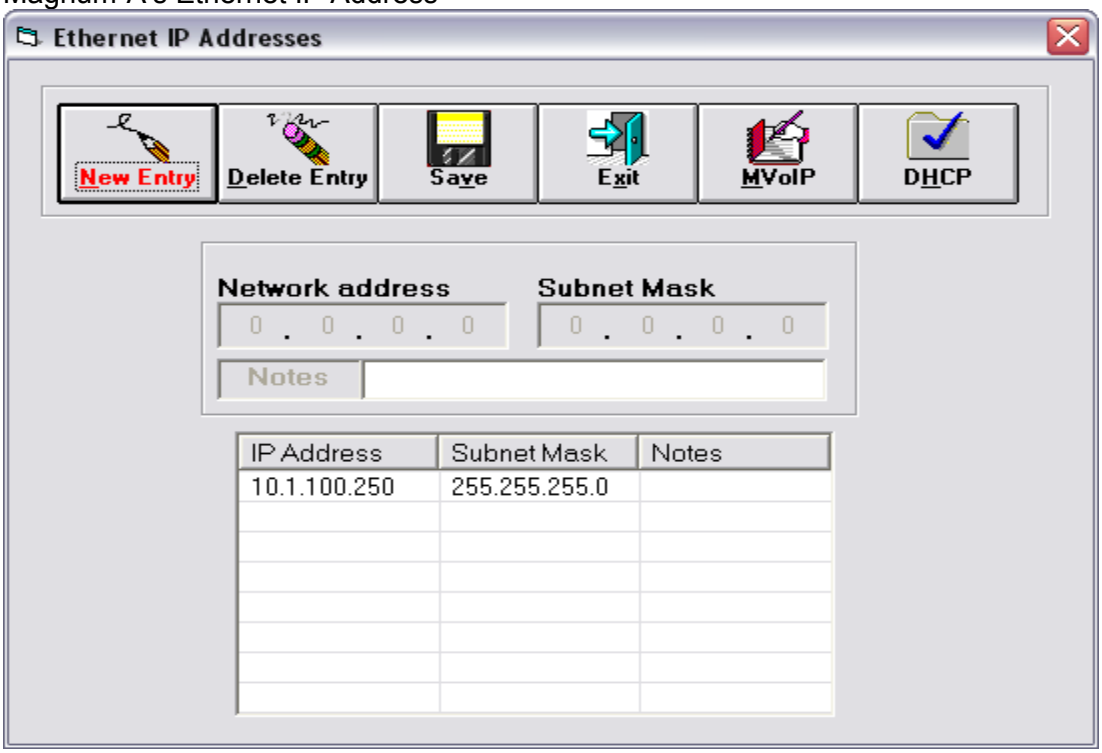


Magnum-B's WAN IP Route Map

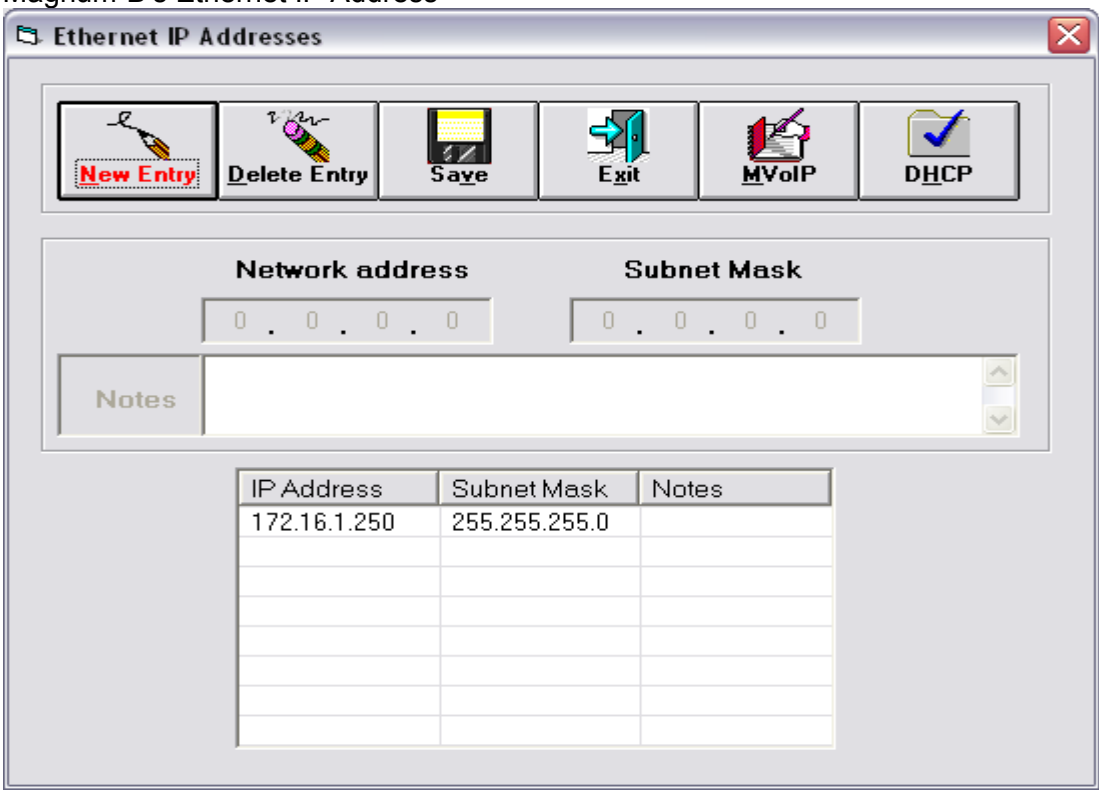


Ethernet Configuration

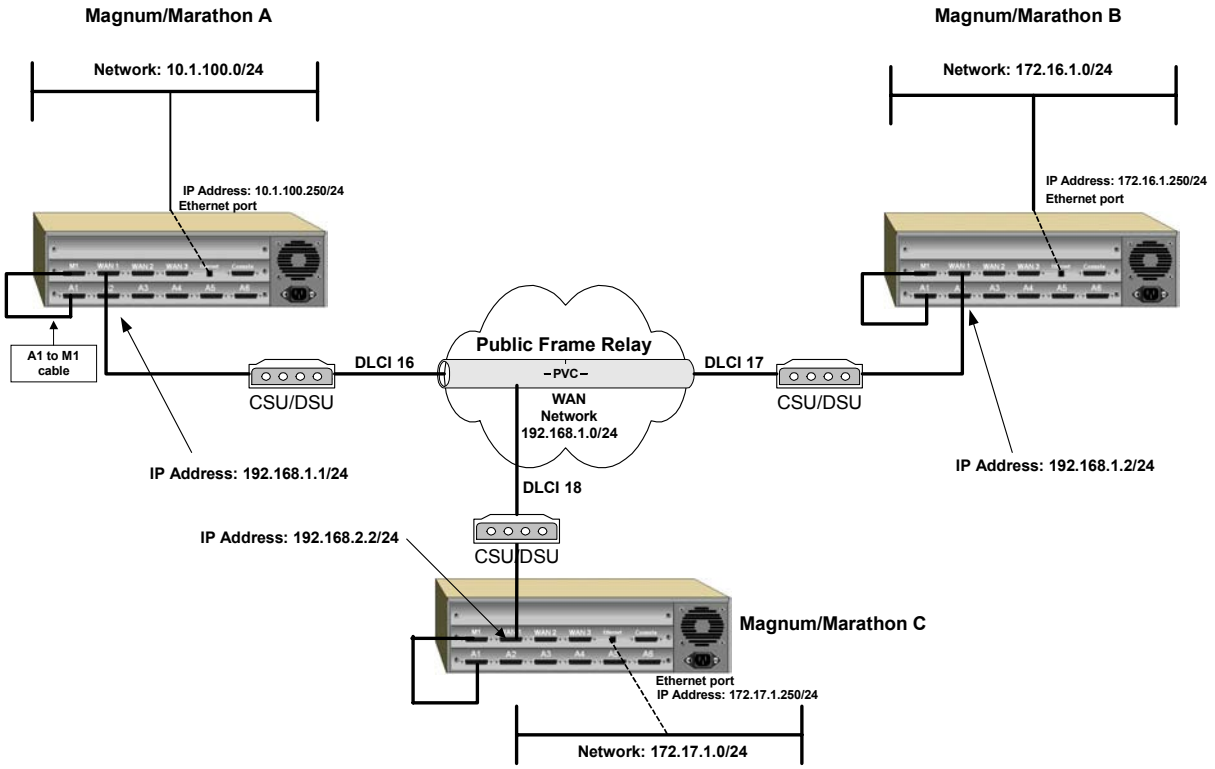
Magnum-A's Ethernet IP Address



Magnum-B's Ethernet IP Address



Sample 3 - Multi-Point Public Frame-Relay Network



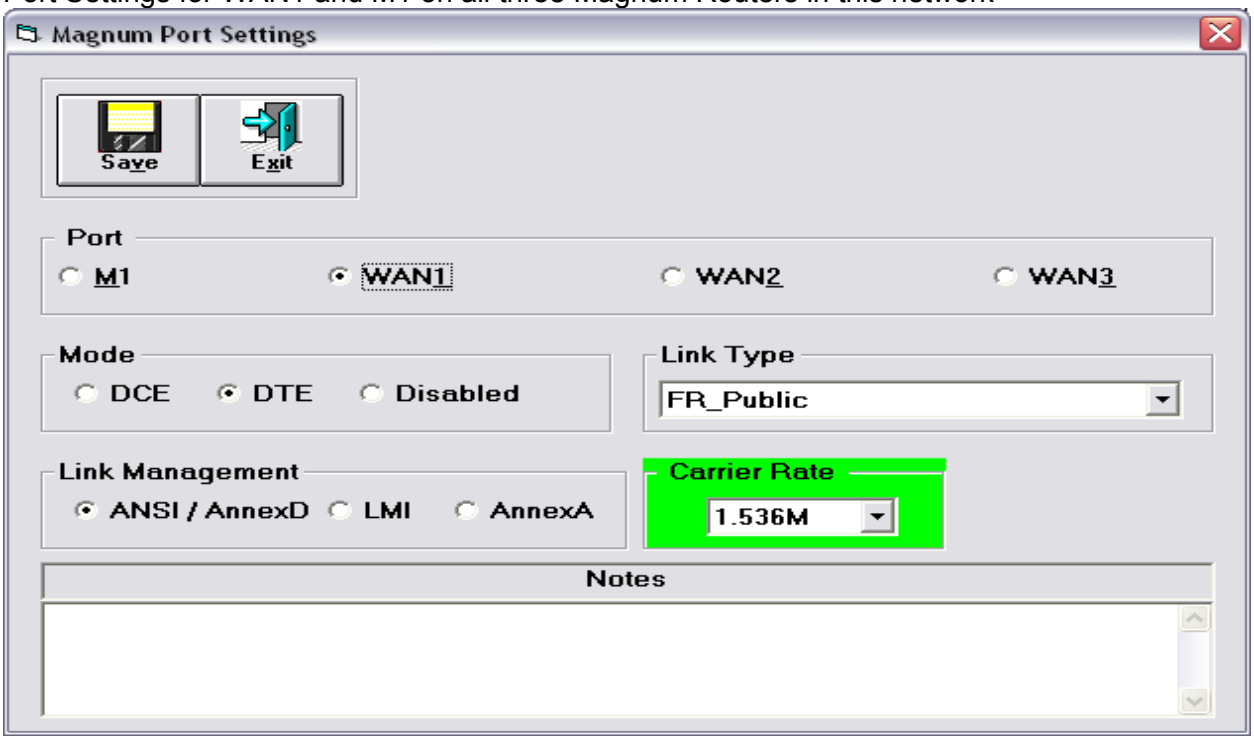
This example is basically the same as the second example, except that a third Magnum Router is being added. Pay close attention to the WAN IP Route Map screens, WAN Configuration screens, and Ethernet Configuration Screens. In this example, multiple IP addresses are used on the WAN Ports, and multiple Virtual DLCI's are utilized.

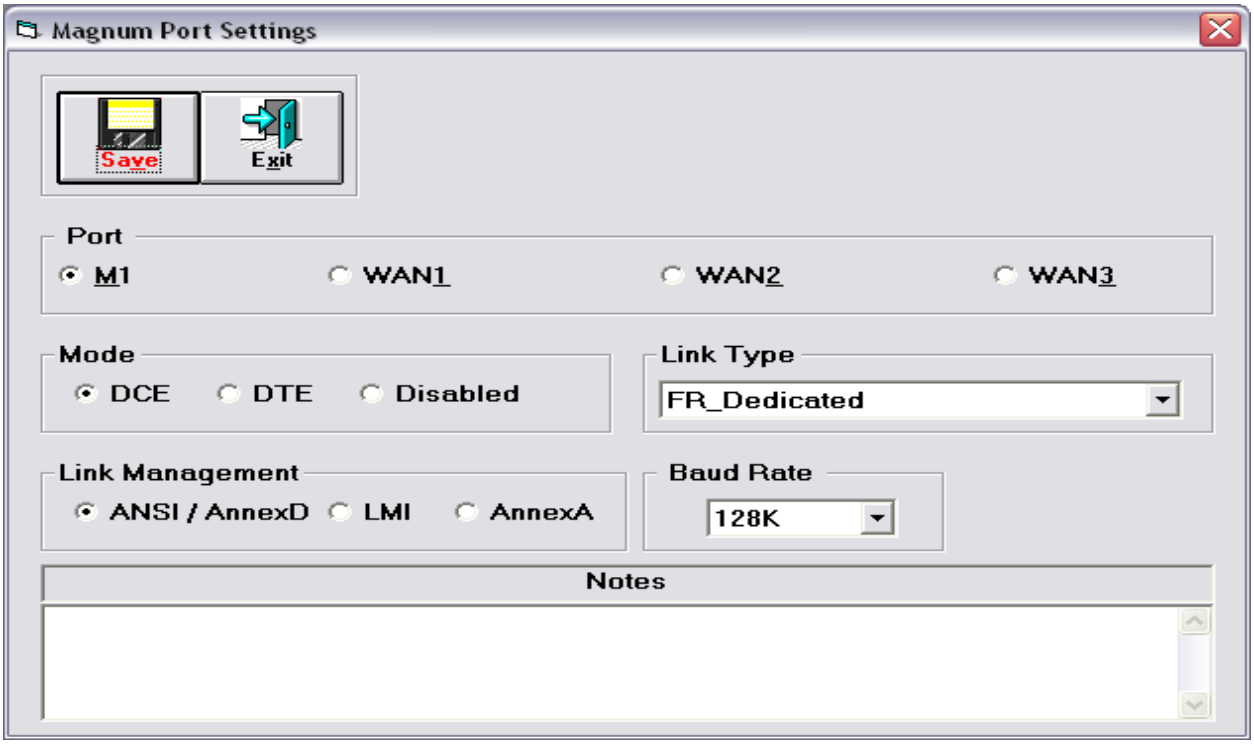
Configuration Files used in this example
Multi-Point Public FRAME-A.CF2
Multi-Point Public FRAME-B.CF2
Multi-Point Public FRAME-C.CF2

Port Settings

Once again, the carrier is supplying all clocking and Frame Relay information, so the WAN1 port on all 3 Magnum Routers will be programmed to be Frame Relay USER ports (FR_Public). Further, the M1 port will be supplying clocking and Frame Relay information to the Marathon, becoming a Frame Relay NETWORK port (FR_Dedicated).

Port Settings for WAN1 and M1 on all three Magnum Routers in this network

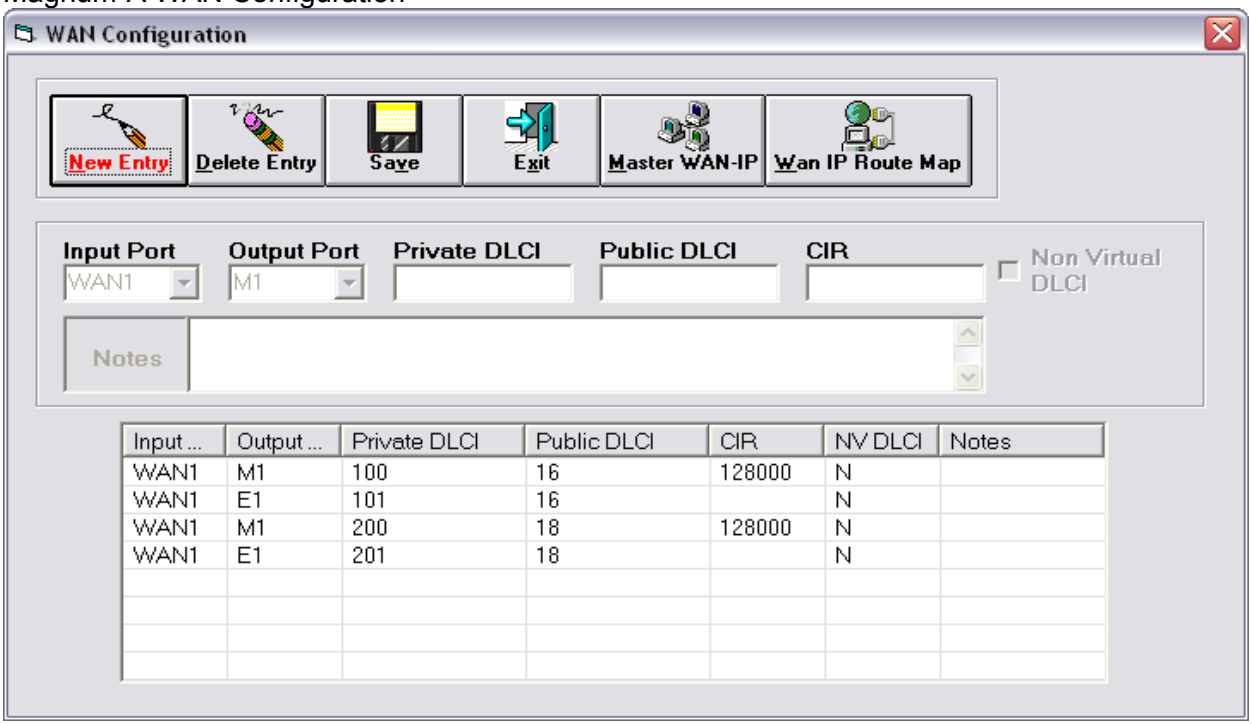




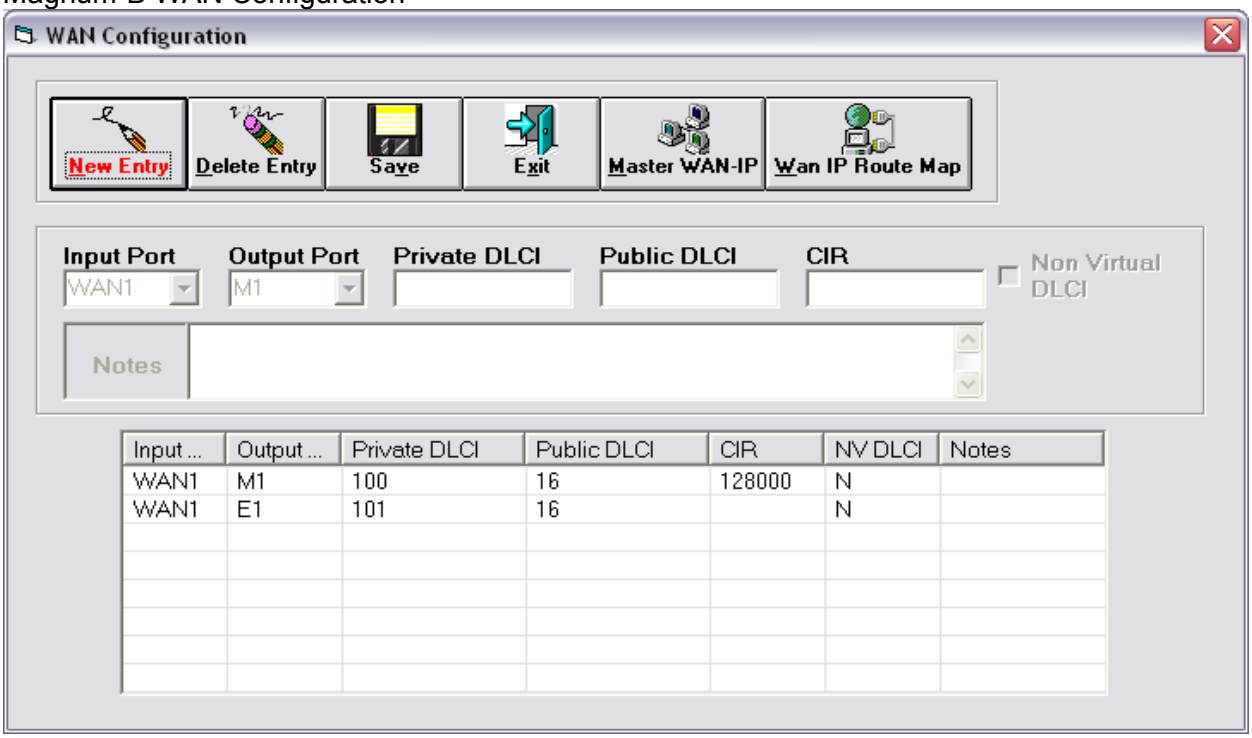
WAN Configuration

As noted earlier, this configuration utilizes multiple Virtual DLCI's. Notice that the PUBLIC DLCI's (17 and 18) are assigned to 4 different PRIVATE DLCI's.

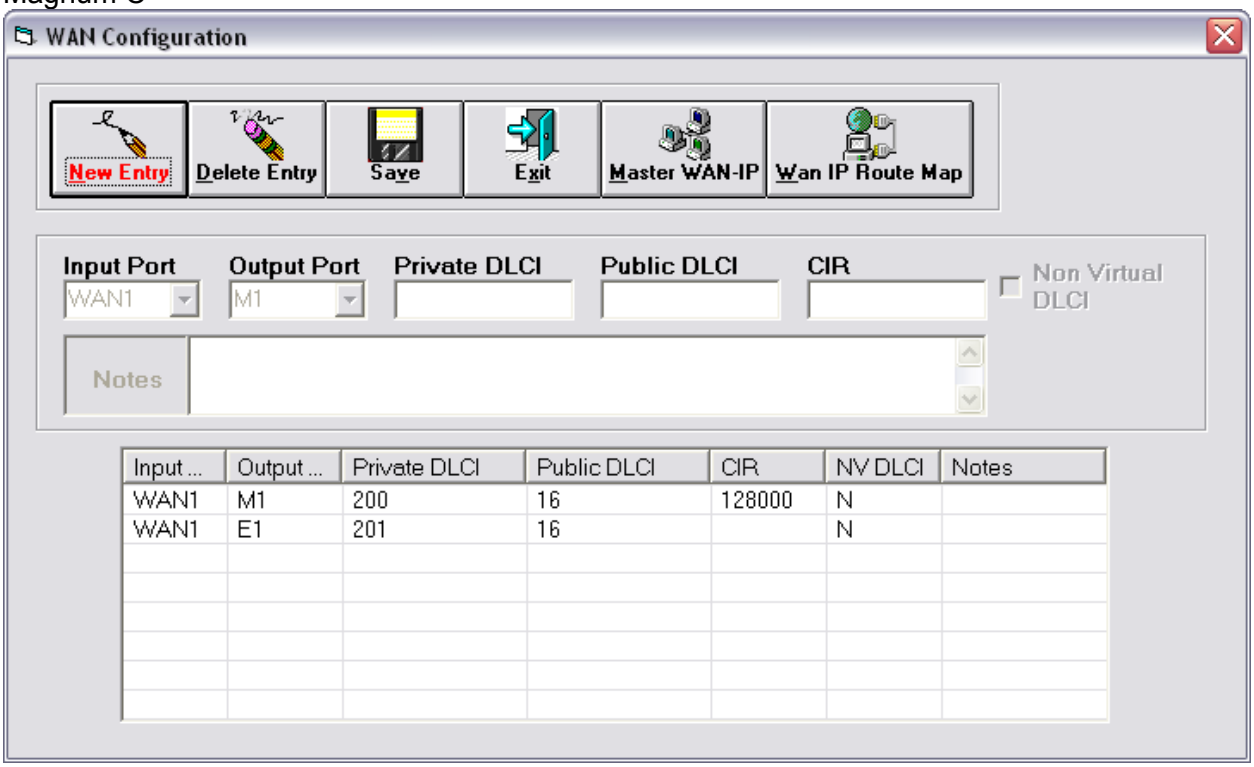
Magnum-A WAN Configuration



Magnum-B WAN Configuration



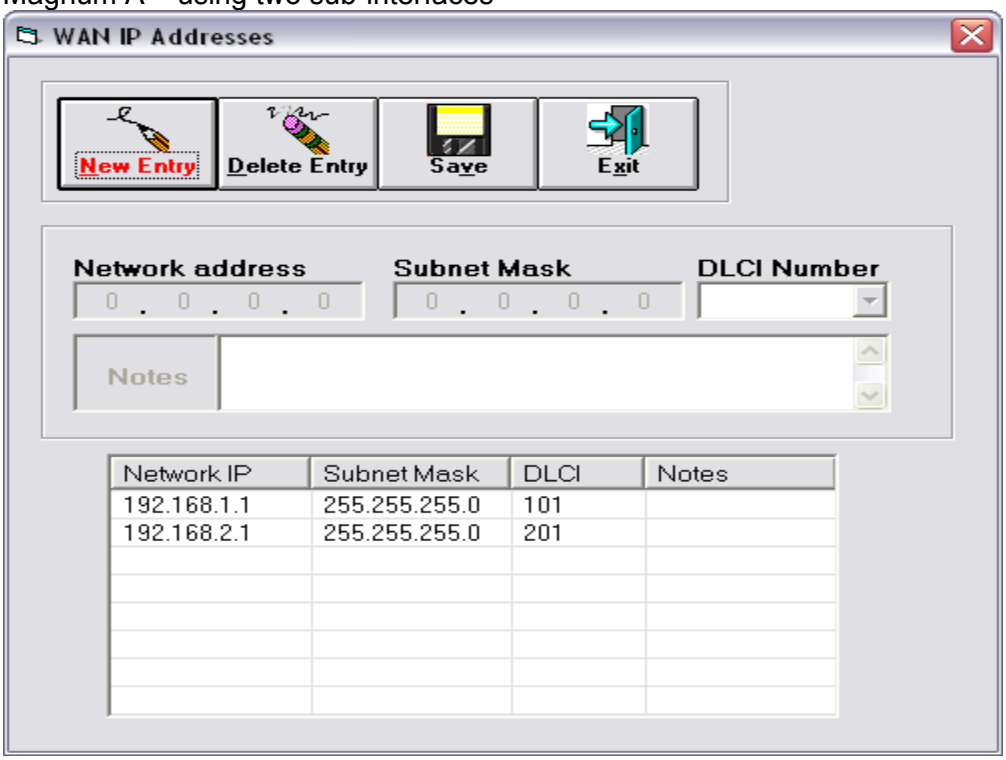
Magnum C



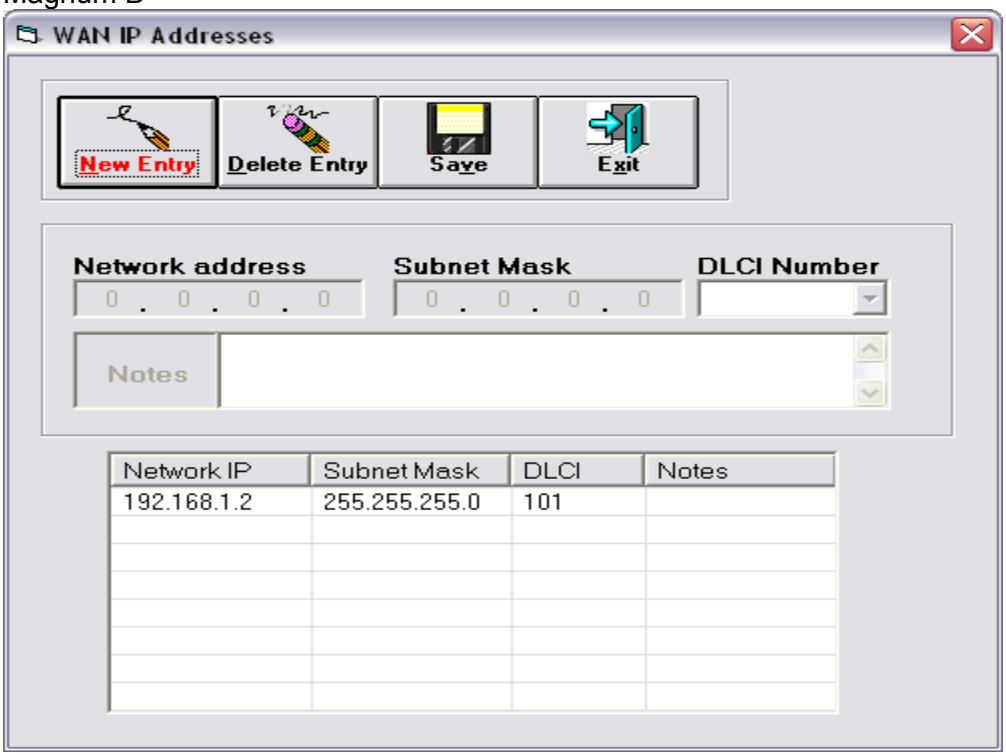
Master WAN IP Address

The following table shows the Master WAN IP Address.

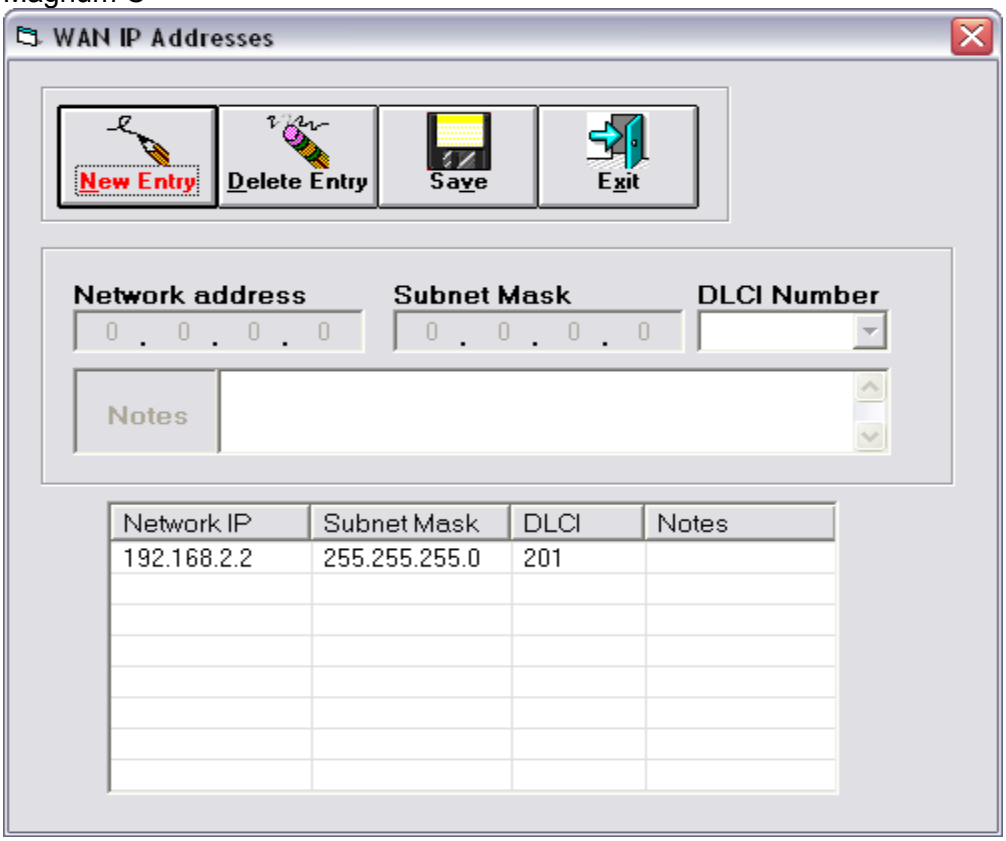
Magnum A – using two sub-interfaces



Magnum B



Magnum C

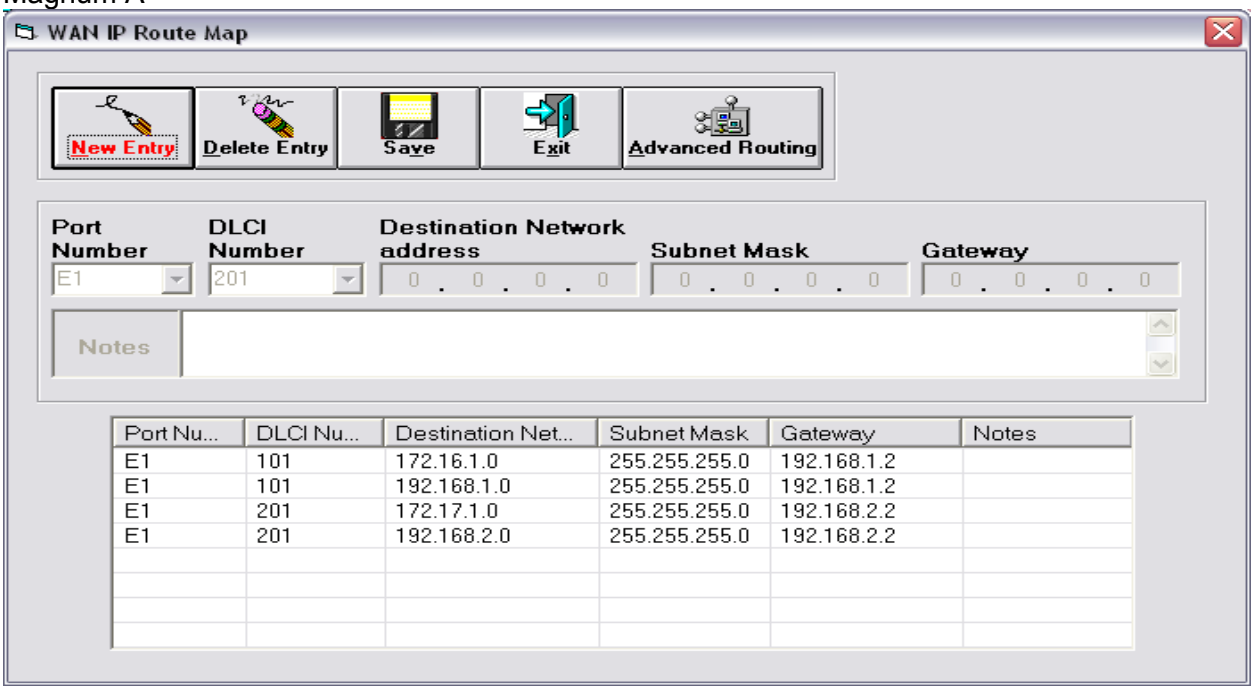


WAN-IP Route Map Table

The following table shows the WAN-IP Route Map Table Configuration associated with this sample configuration.

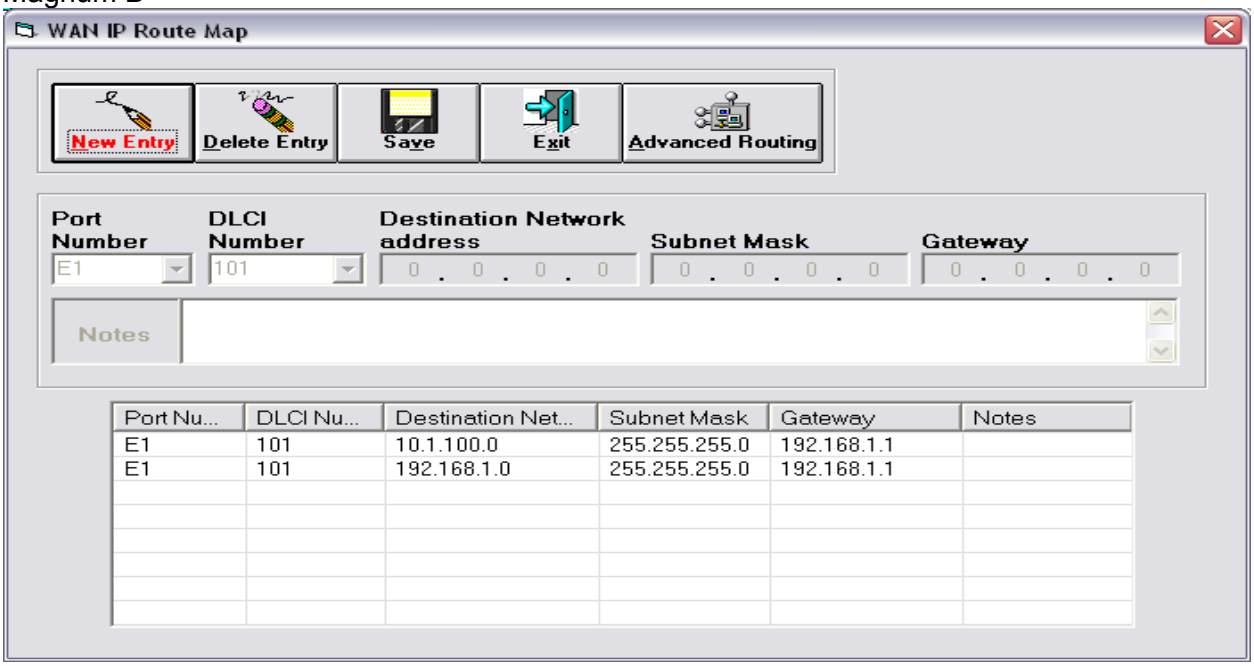
See chapter 7 for detailed information on using the Magnum Router Manager to change data in the DLCI-IP Map Table.

Magnum A



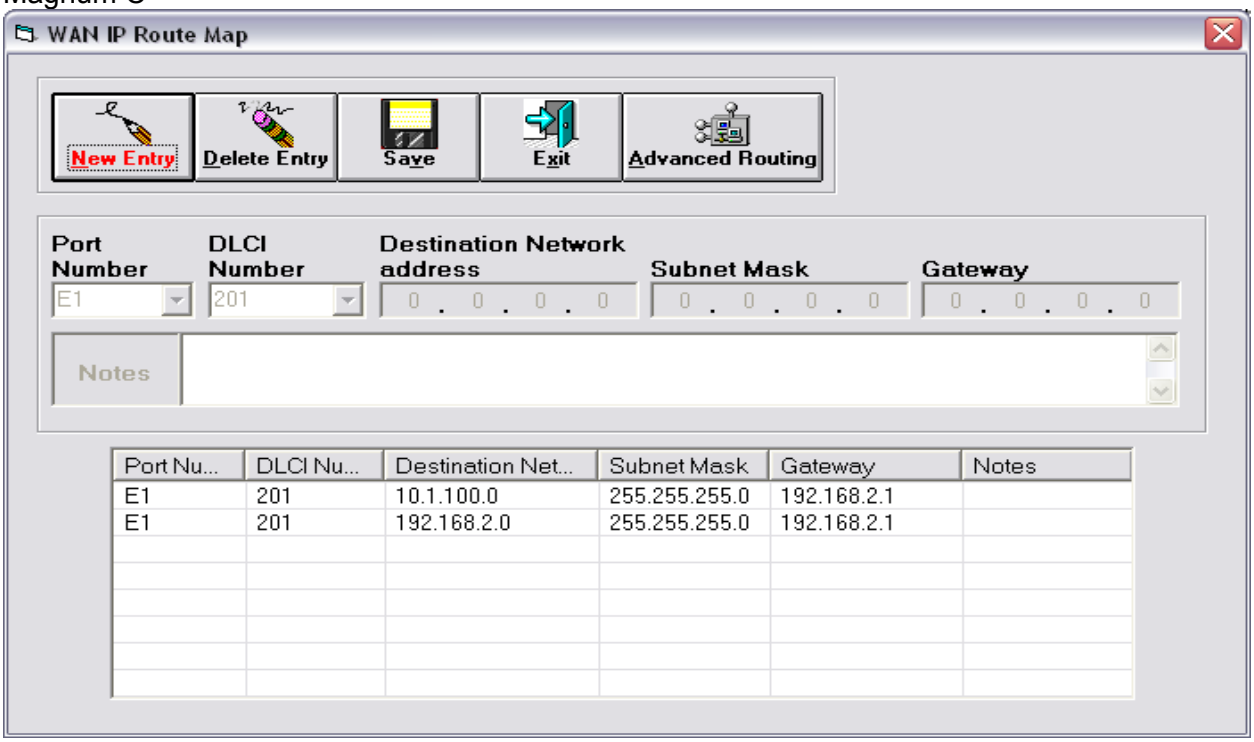
Port Nu...	DLCI Nu...	Destination Net...	Subnet Mask	Gateway	Notes
E1	101	172.16.1.0	255.255.255.0	192.168.1.2	
E1	101	192.168.1.0	255.255.255.0	192.168.1.2	
E1	201	172.17.1.0	255.255.255.0	192.168.2.2	
E1	201	192.168.2.0	255.255.255.0	192.168.2.2	

Magnum B



Port Nu...	DLCI Nu...	Destination Net...	Subnet Mask	Gateway	Notes
E1	101	10.1.100.0	255.255.255.0	192.168.1.1	
E1	101	192.168.1.0	255.255.255.0	192.168.1.1	

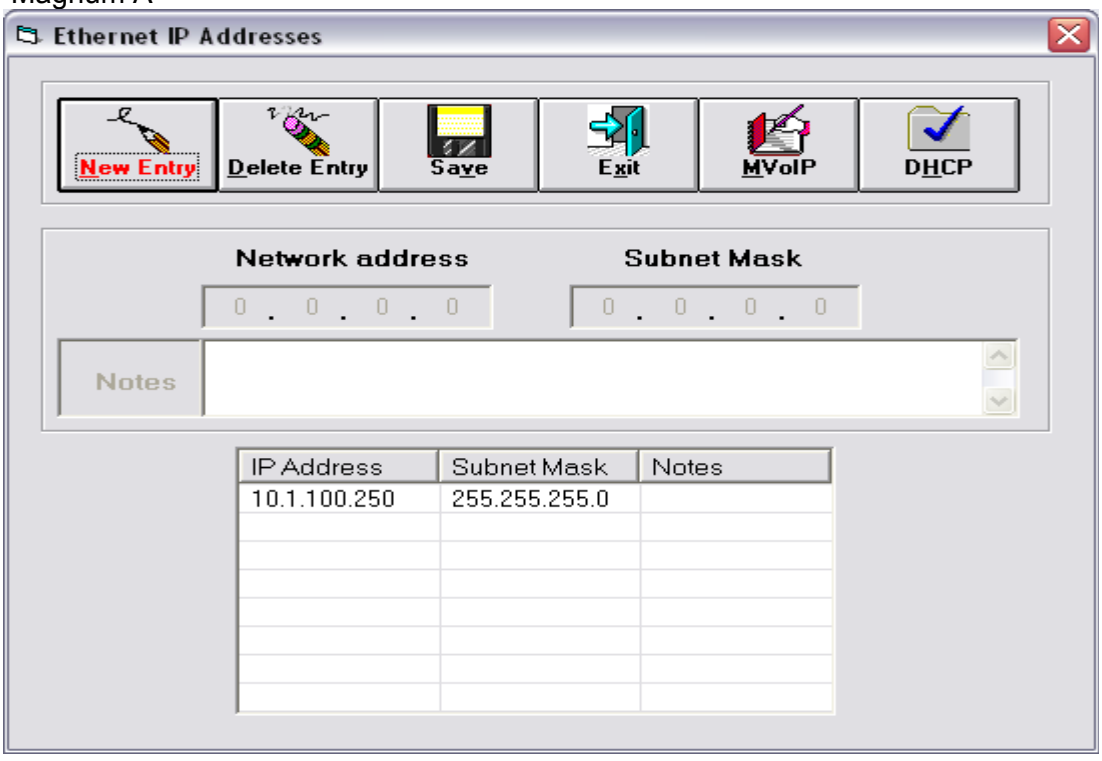
Magnum C



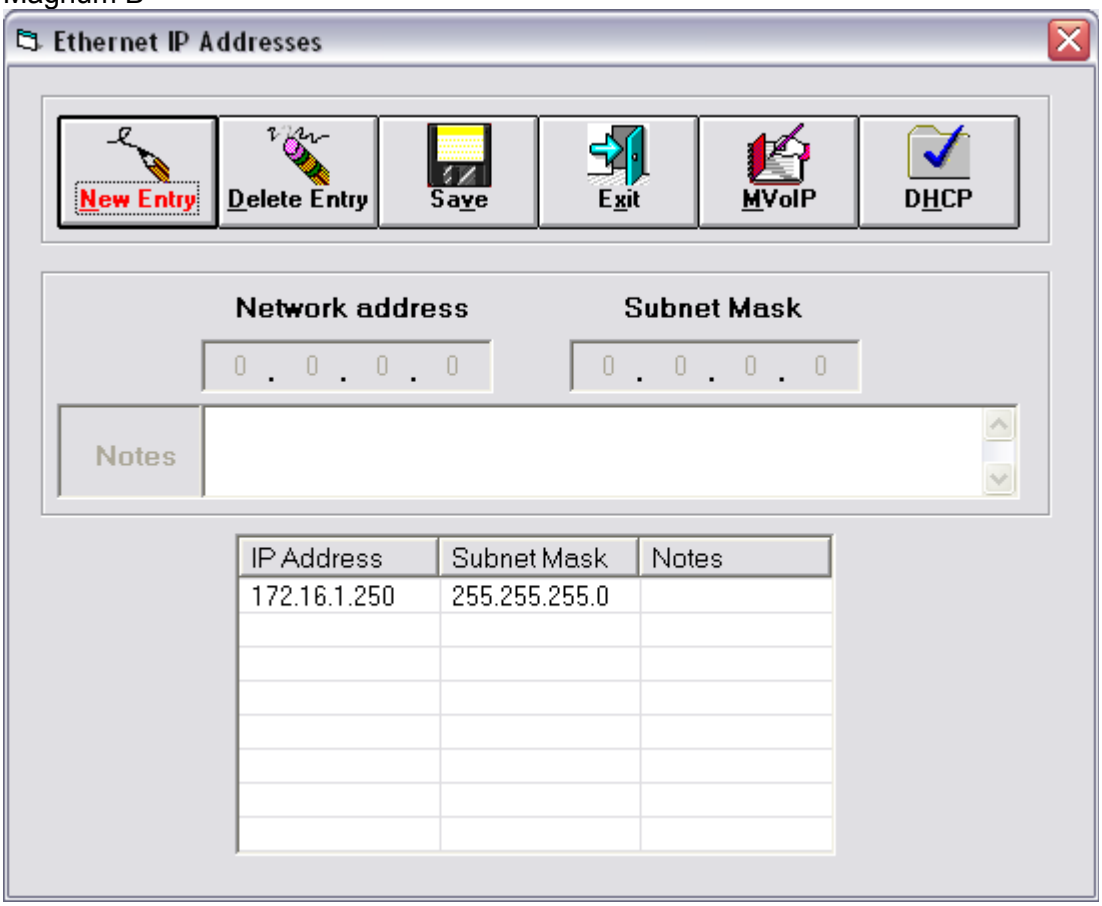
Ethernet Configuration

The following window illustrates the Ethernet Configuration associated with this sample configuration.

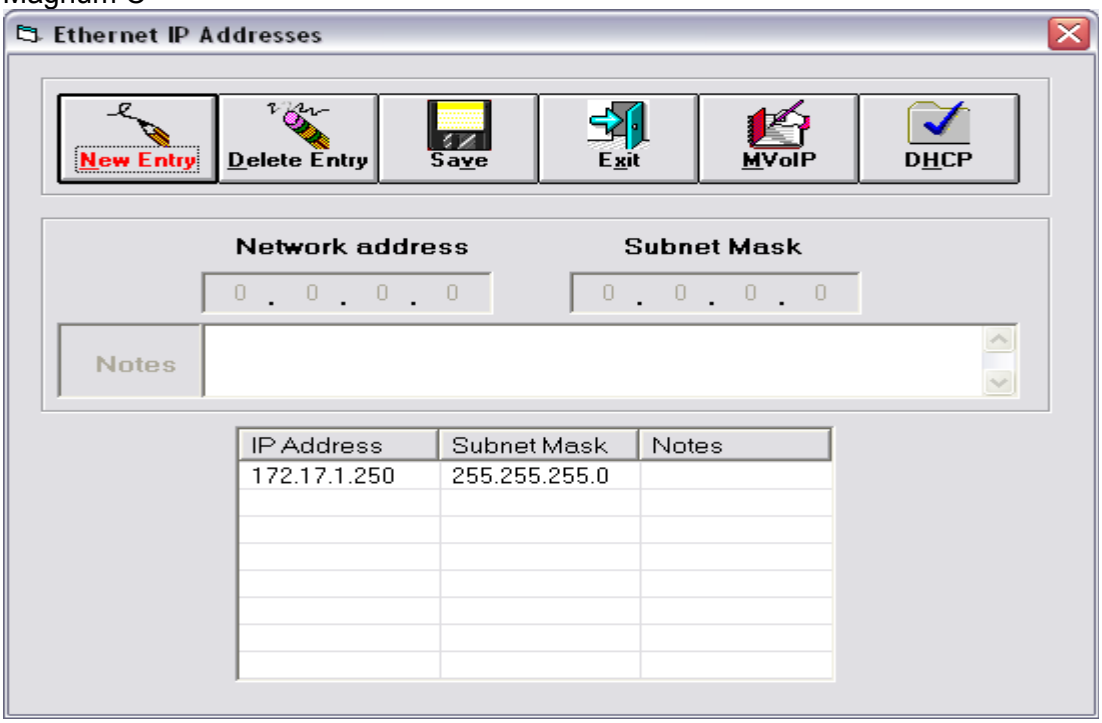
Magnum A



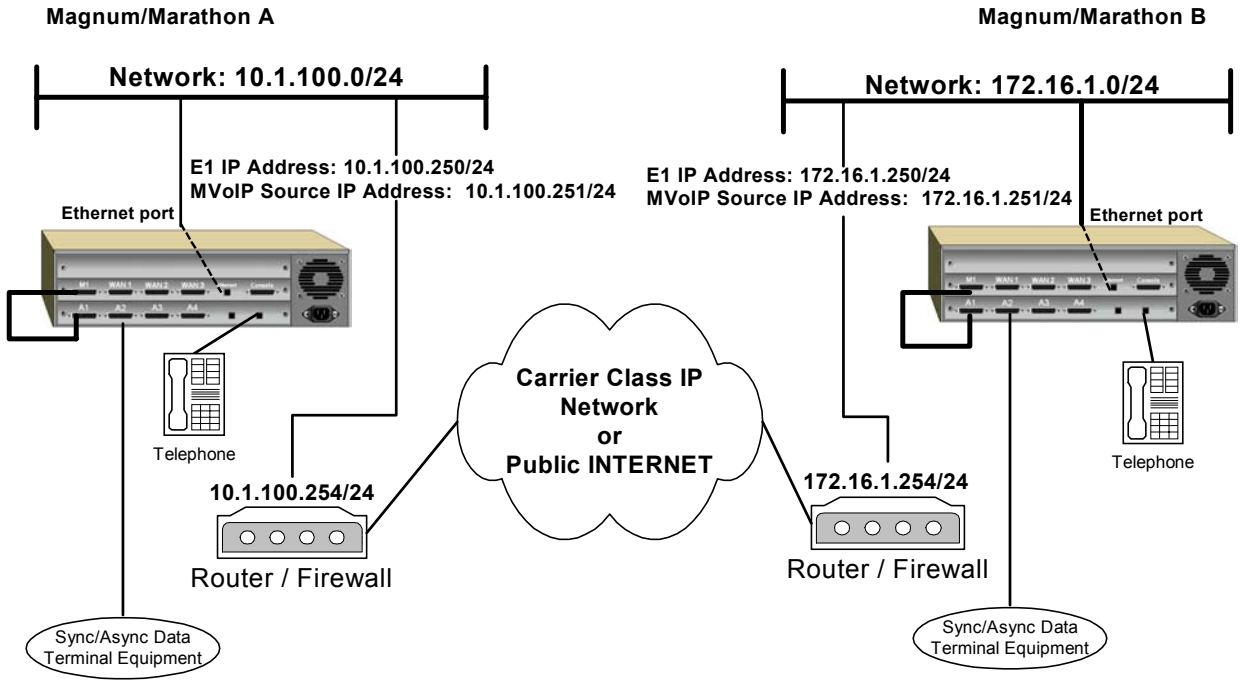
Magnum B



Magnum C



Sample 4 - MicroBand VoIP

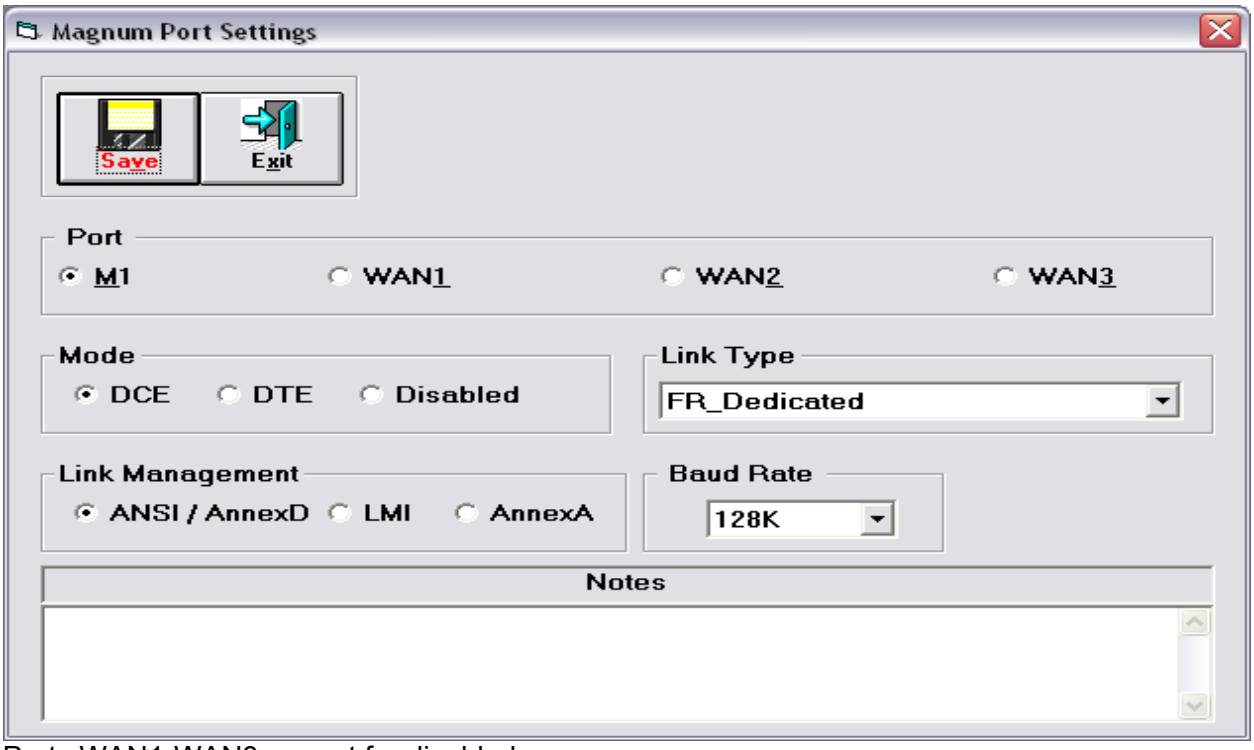


In the above diagram, a simple point-to-point IP network will be used to transport Micom Marathon traffic across the internet.

Configuration Files used in this example
MVoIP-A.CF2
MVoIP-B.CF2

Port Settings

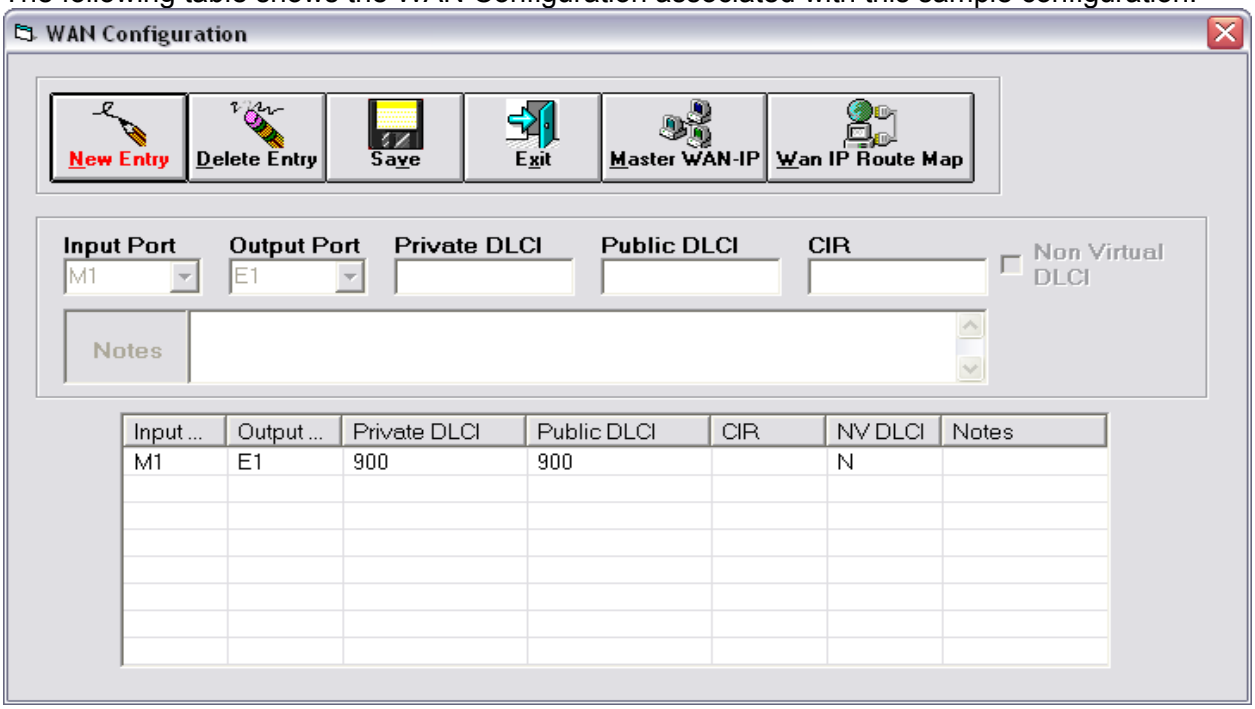
Port settings for all ports in the Microband VoIP sample are the same on both Magnum A and Magnum B.



Ports WAN1-WAN3 are set for disabled.

WAN Configuration

The following table shows the WAN Configuration associated with this sample configuration.



DLCI's 900-989 are used for Microband VoIP when a WAN configuration entry includes the E1 port

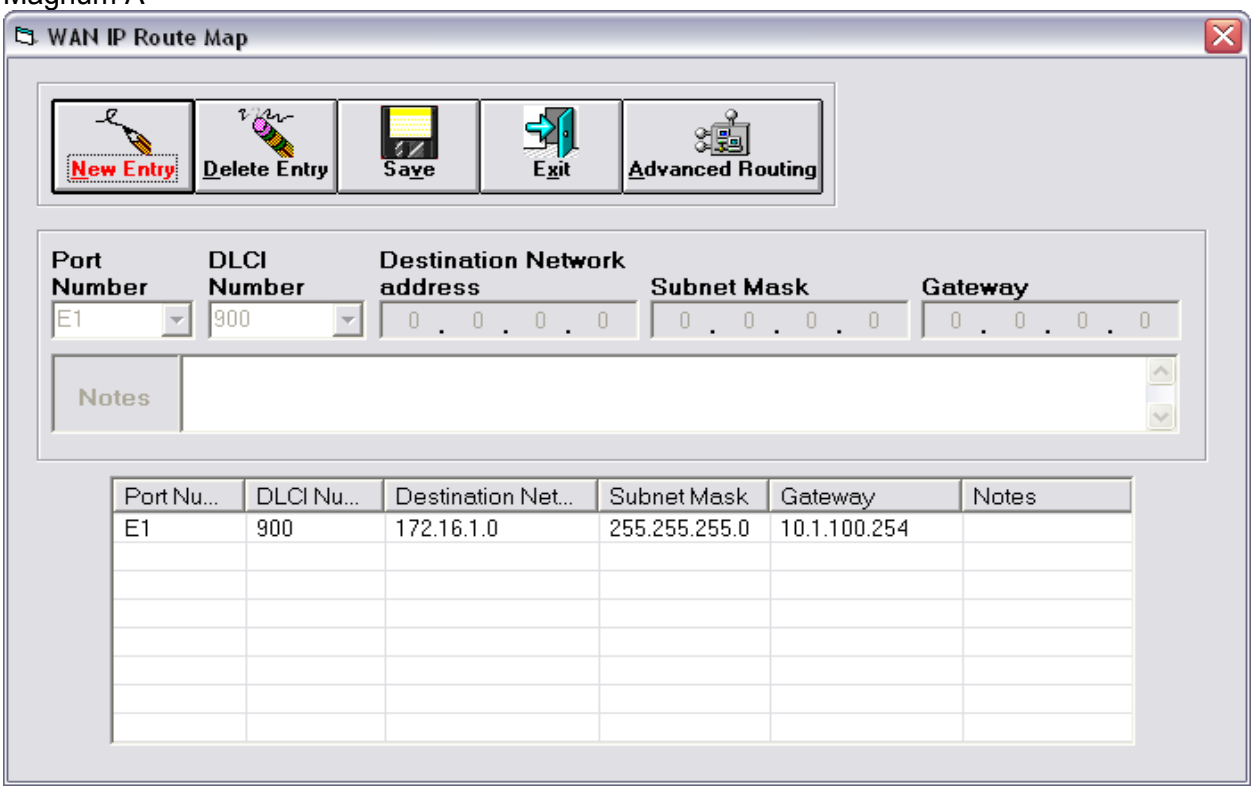
When DLCI's within the range of 900 through 989 are specified in the Magnum Router, referencing an output port of E1, the Magnum Router will automatically encapsulate any traffic on the referenced input port (such as M1). However, if any of the DLCI's from 900 to 989 are used to connect one WAN port to another (such as WAN1 to M1), the Magnum Router will treat that connection just like any other PVC connection.

Also note that when using the Microband VoIP features, the CIR should be set the same as the clock speed on the M1 port. The default clock speed on M1 is 128K.

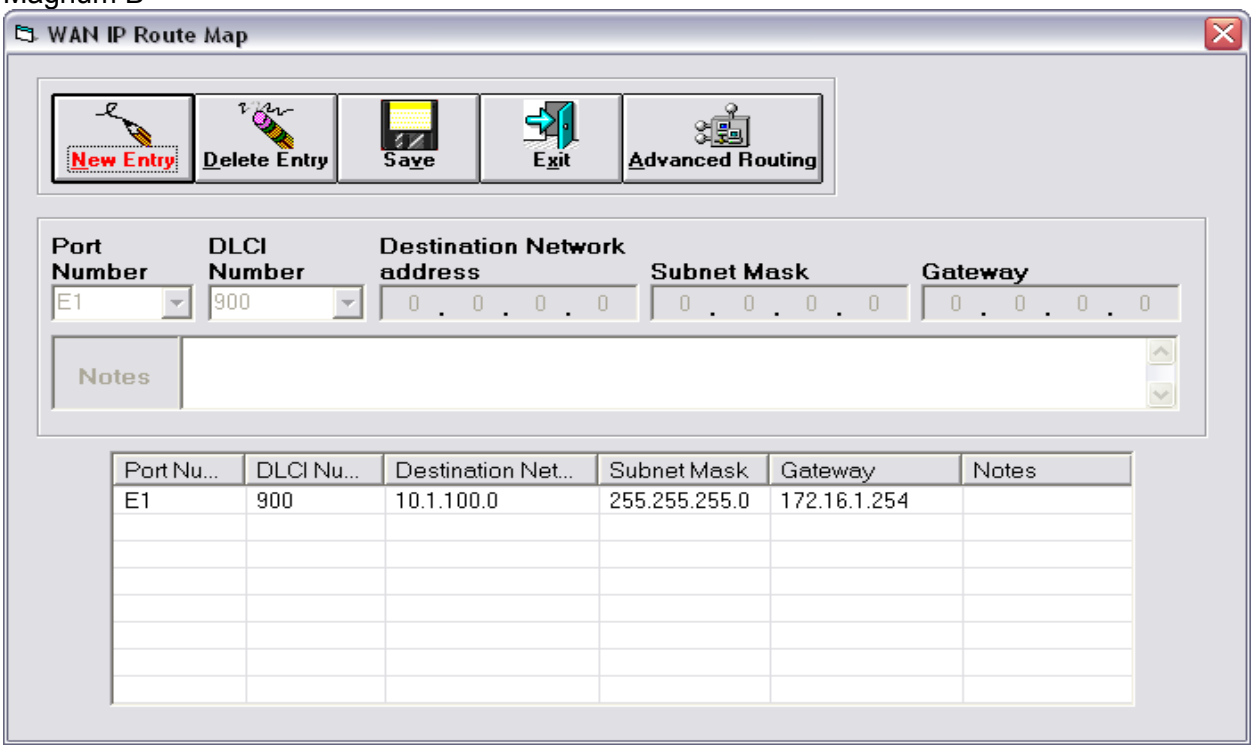
Master WAN IP Address
When configuring the Magnum Routers for Microband VoIP, there is no need to assign a serial IP address in the Master WAN IP address table. The actual routing of any traffic is done through the Ethernet (E1 port).

WAN-IP Route Map Table
The following table shows the WAN-IP Route Map Table Configuration associated with this sample configuration.

Magnum A



Magnum B



The Gateway is the local router or firewall that will carry the network traffic across the WAN or Internet.

See chapter 7 for detailed information on using the Magnum Router Manager to change data in the DLCI-IP Map Table.

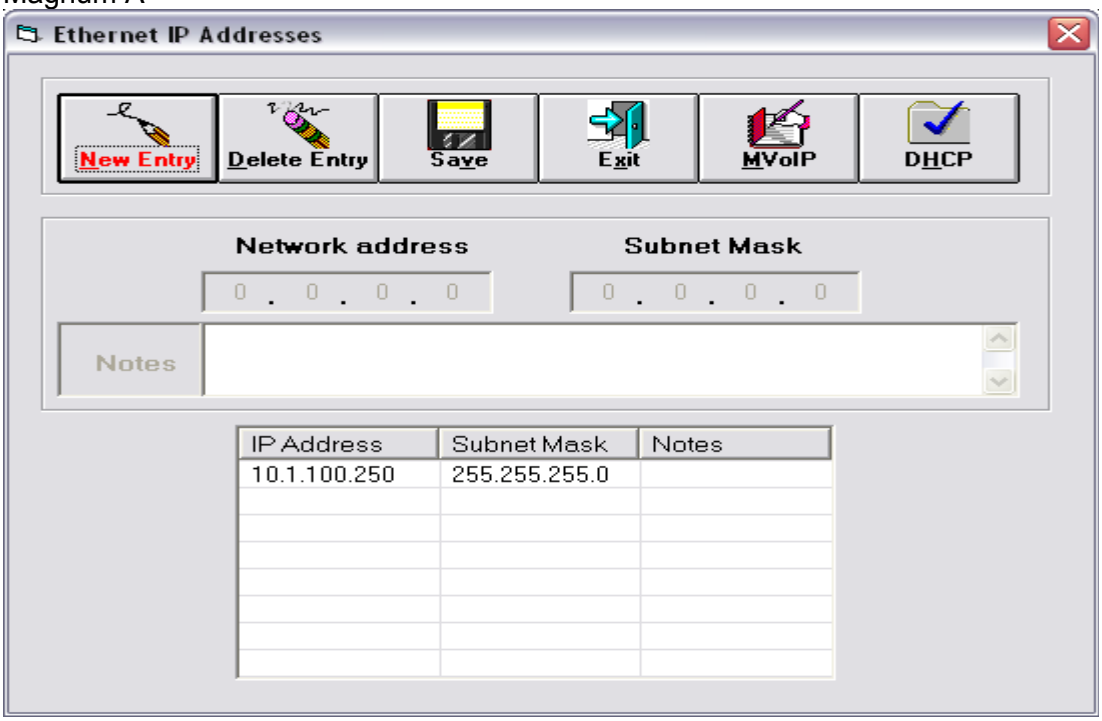
Advanced Routing

The Advanced Routing table function as described in chapter 7. The entries in the WAN Configuration screens are automatically written to the Advanced Routing tables.

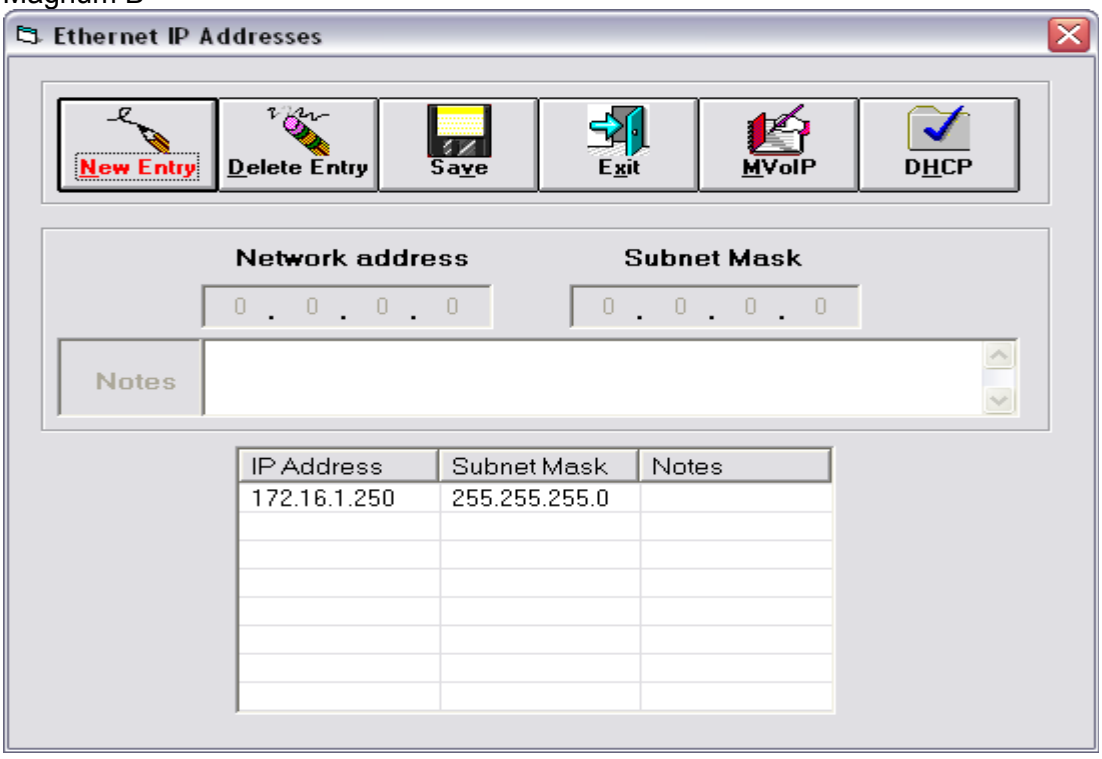
Ethernet Configuration

The following window illustrates the Ethernet Configuration associated with this sample configuration.

Magnum A



Magnum B



Microband VoIP Configuration

In order to successfully configure MVoIP, you will need two IP addresses on the same subnet: one is for the Ethernet (E1) interface and one is for MVoIP driver (also referred to as the "source" address). In this example, the IP addresses to be used are as follows:

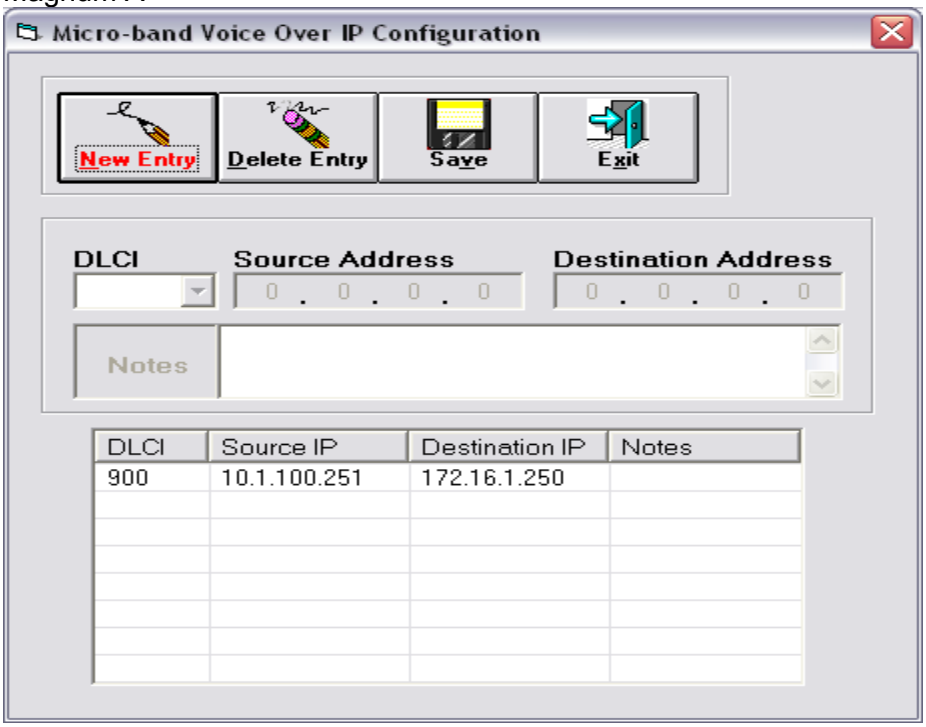
Magnum A:
E1 IP address: 10.1.100.250 / 24
MVoIP address: 10.1.100.251 / 24

Magnum B:
E1 IP address: 172.16.1.250 / 24
MVoIP address: 172.16.1.251 / 24

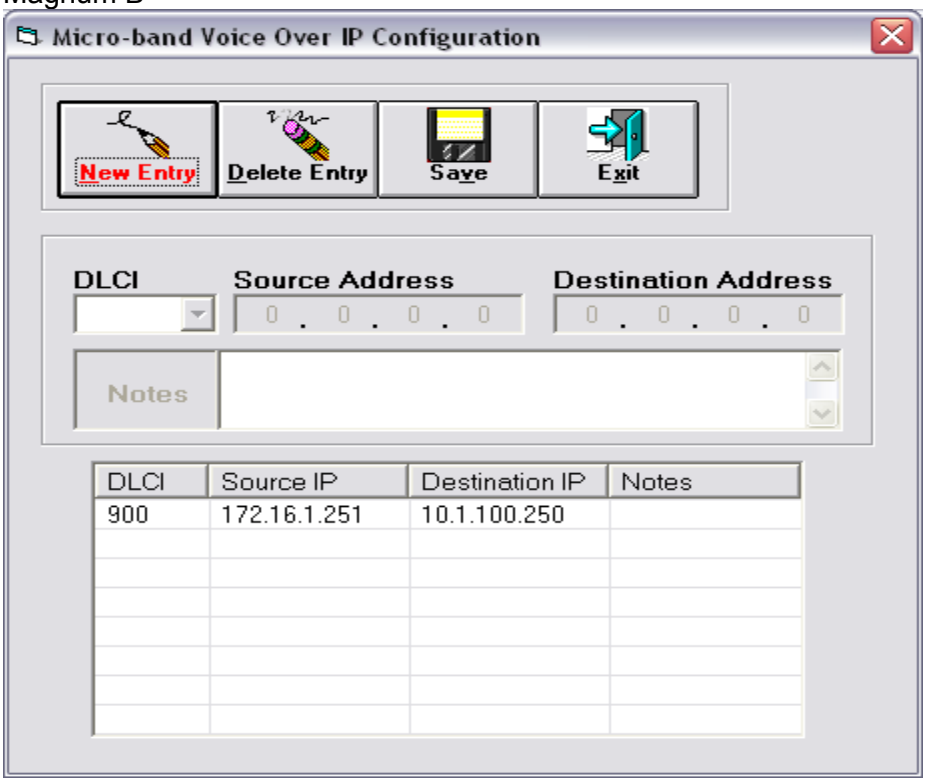
Although the above IP address would be from a private IP network, MVoIP can also run over the public internet, VPN Tunnels and even wireless systems. In all cases, it is a requirement that 2 IP address of the same subnet be supplied.

The following windows illustrate the MVoIP Configuration associated with this sample configuration:

Magnum A



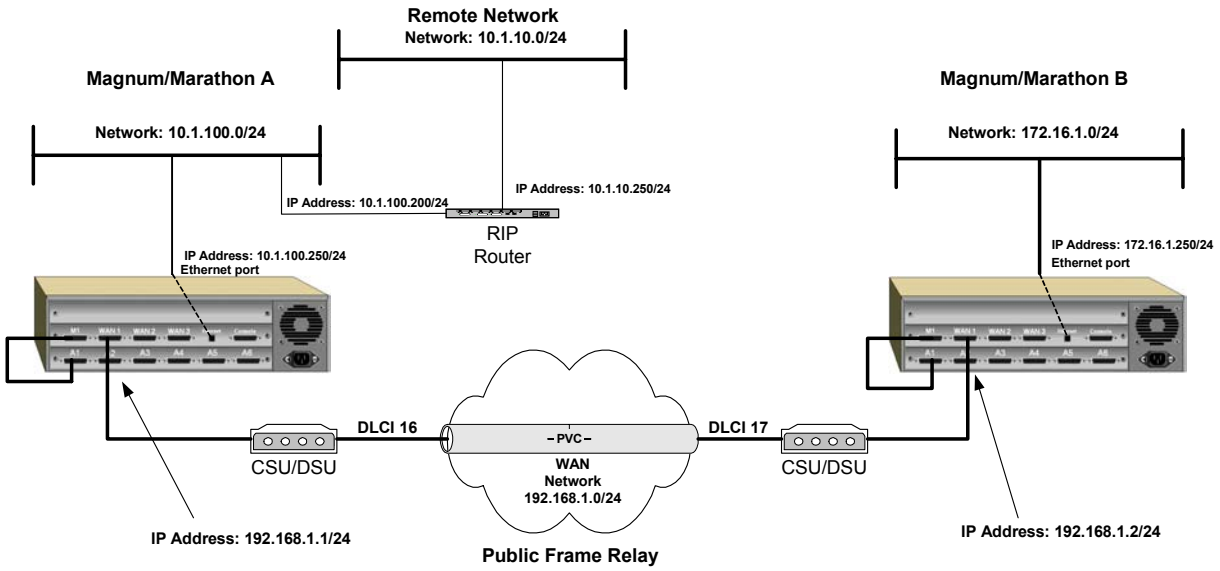
Magnum B



The destination IP is the Ethernet Interface of the target Magnum/Marathon unit on the other end of the network. (Please refer to the Microband VoIP diagram at the beginning of this example)

See Chapter 7 for detailed information on using the Magnum Router Manager to change data in the MVoIP Table.

Sample 5 – RIP Routing Point to Point Network



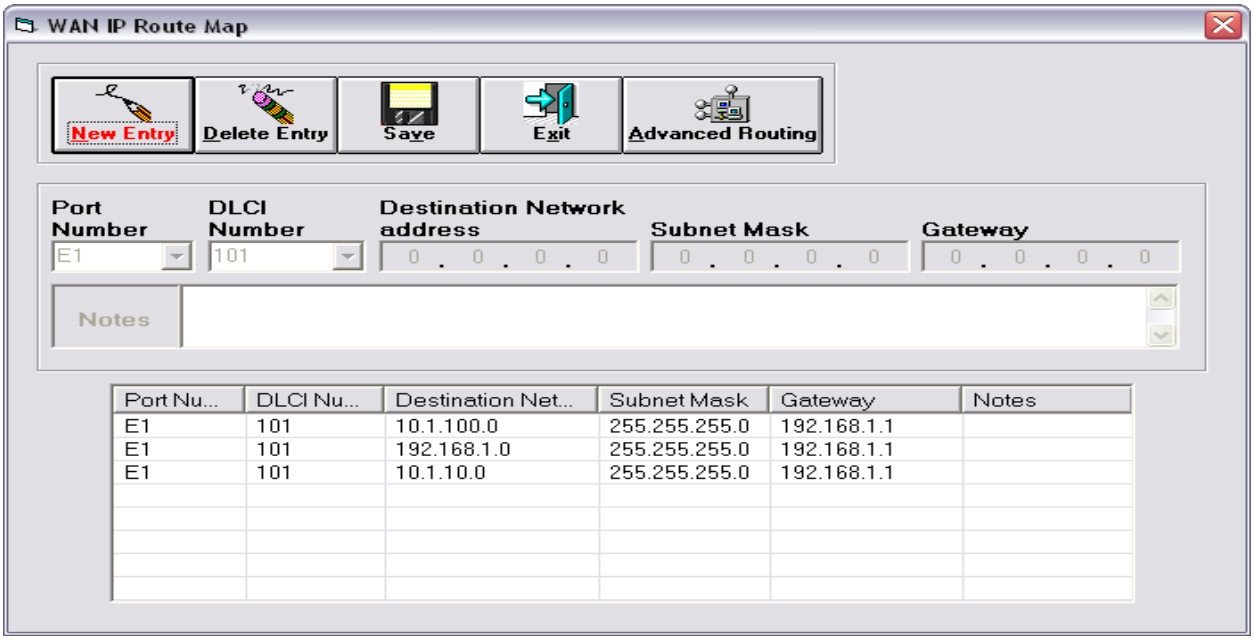
In the above sample drawing, a point-to-point Magnum network needs to tie together not only the networks directly attached to it, but also a remote network that has a generic brand-x router running a RIP protocol.

This sample is built from sample #2, Public Point-To-Point Frame Relay Network. All the WAN and Ethernet programming is identical to sample #2 with the exception of some additional entries in the WAN IP Route Map and Ethernet Configuration screens.

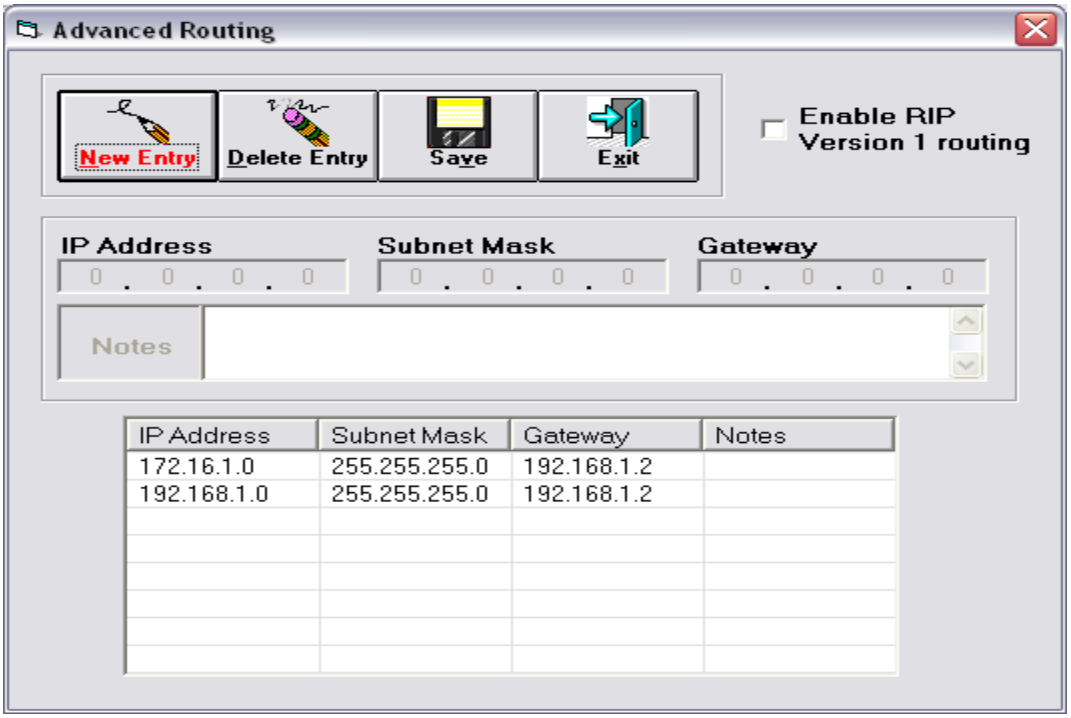
In this sample, only the screens that have been changed are shown. Refer to Sample #2 for all other configurations.

Using RIP routing, Magnum A, Magnum B and the RIP router will all exchange IP routing tables, but Magnum B won't be able to use the information to get to the remote network across the WAN. This is where static routing is required on the Magnum B WAN side. The Ethernet ports of Magnum A and the RIP router will communicate and route seamlessly.

The only additional information needed is to program the route for the remote network into Magnum B's WAN IP Route Map table as shown below:

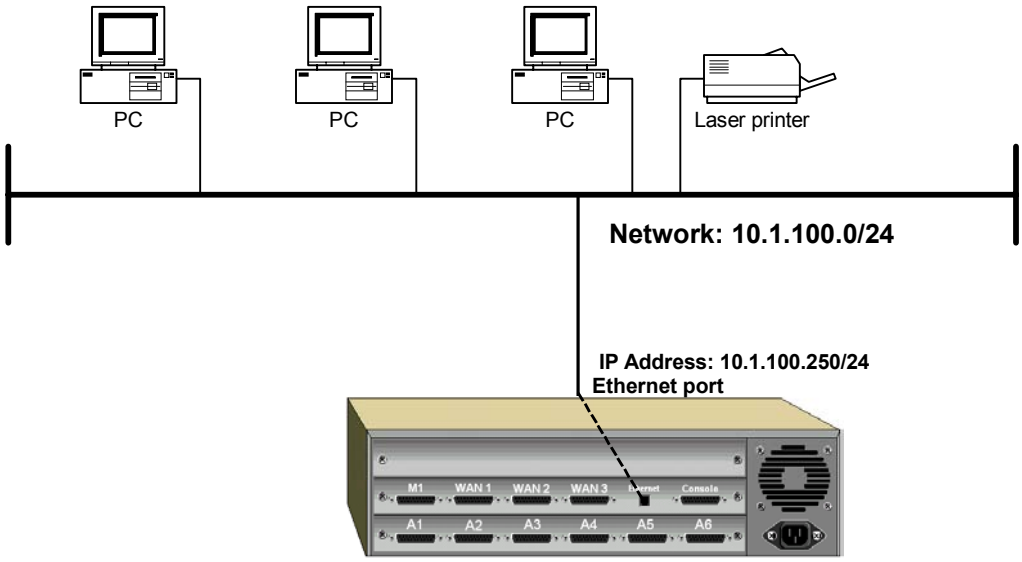


On Magnum A, RIP routing needs to be enabled. To do this, click on the WAN Config button, then select the WAN IP Route Map button and finally the Advanced Routing button. The following screen will be displayed:



In the upper right hand corner of this screen is a box to enable or disable RIP Version 1 routing. Click on the box to add or remove the check mark signifying that RIP is enabled or disabled and then click on ***Save*** followed by ***Exit.***

Sample 6 – DHCP Server



Magnum/Marathon A

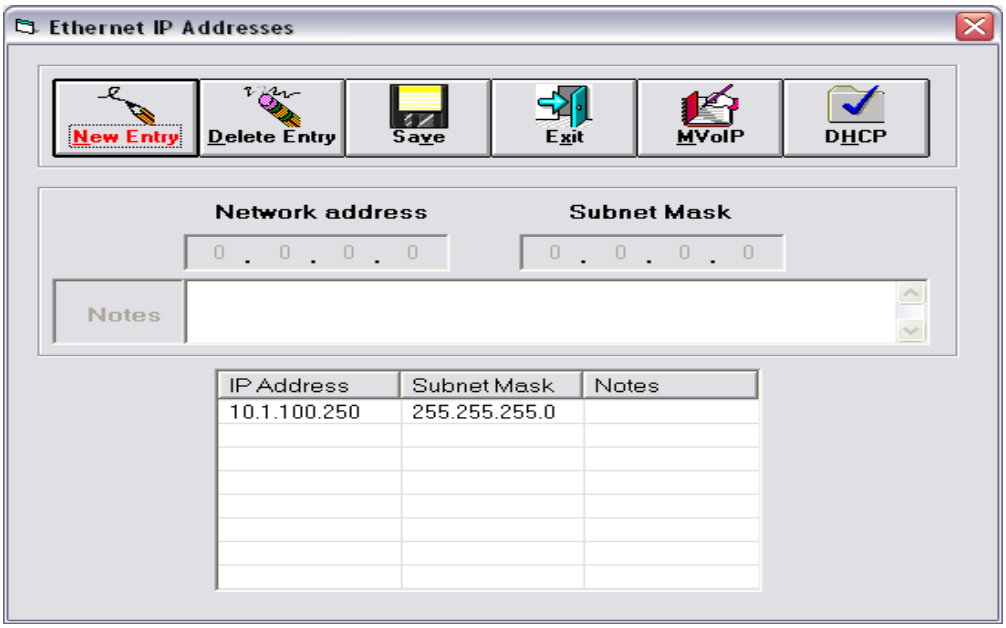
The above diagram shows an example of how the Magnum Router can operate as a local DHCP server. It cannot function as an enterprise level DHCP server, pass DHCP traffic across any of its WAN ports, does not support BOOTP processing and does not support multiple scopes..

It will supply to the local IP host device such things as an IP address, WINS addresses (up to 3), DNS addresses (up to 3), Domain Name and default gateway information.

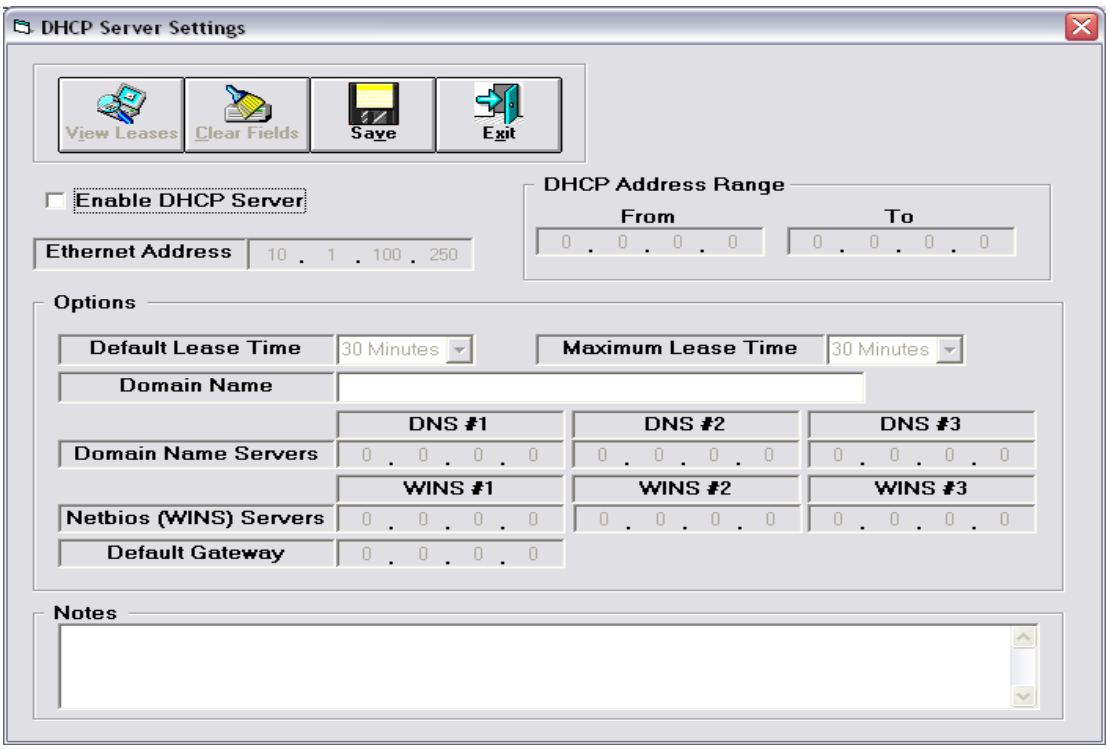
Programming the DHCP server requires that an IP address be entered in the Ethernet Configuration screen. Multiple IP addresses can be entered in the Ethernet Configuration screen (up to 255), but only one can be selected to work as the host IP for the DHCP server.

In the above diagram, the Ethernet port of the Magnum Router is programmed for an IP address of 10.1.100.250 with a subnet mask of 255.255.255.0

Below is an example of the Ethernet Configuration screen for the above diagram.



Click on the entry in the table of the Ethernet Configuration screen, highlighting the entry for 10.1.100.250 by clicking once on it and then click on the ***DHCP*** button to display the DHCP Configuration screen.



By default, the DHCP server function is disabled. Click on the box next to ***Enable DHCP Server*** to enable the fields on the screen.

Enter the required data, such as WINS server IP addresses, DNS addresses and IP Range.

Chapter 10: Magnum Router Troubleshooting

LED Display Indicators

The LED display indicators are found on the front of the module and are viewable from the front side of the Marathon base unit chassis. The LED messages are displayed in the table below:

LED	Color	Meaning
OK	Red	Unit is successfully installed in the Marathon base unit chassis
OK	Off	Magnum Router module is **NOT** installed properly (power down and check to ensure the module is "seated" properly in the Marathon module stack)
LK	Green	Magnum 10/100 Base-T UTP Ethernet port is successfully plugged into a local LAN switch or hub port
LK	Red	Magnum 10/100 Base-T UTP Ethernet port is **NOT** successful plugged into a local LAN switch or hub port (double check that you have used the patch cord / LAN cable provided p/n M5000C/CAT5E and that you have a known good switch/hub port
W3	Green	WAN port is up and operational
W2		
W1		
W3	Red	WAN port is NOT up or operational
W2		
W1		
M1	Green	M1 Magnum to A1 Marathon link is successfully programmed and operational
M1	Red	M1 Magnum to A1 Marathon link is not up or operational.

Magnum Router Hardware Problems

Magnum Router Power-up Self Test Problems

Symptom: No red OK LED Indicator
Solution: Magnum Router Module is not seated properly in Marathon base unit. Power off Marathon base unit and check for proper installation. See chapter 4 for Magnum Router Module hardware installation instructions.

Symptom: All LED's are blinking rapidly.
Solution: Hardware failure. Unit must be repaired. Contact your authorized Magnum / Marathon Dealer for a replacement .

Frame Relay Link Does Not Come Up

Symptom: WAN port LED is red or off, indicating that no valid frame relay LMI packets have been exchanged.
Solution:

- Magnum Router Module port physical configuration is wrong for attached device.
  If connecting CSU/DSU, Magnum Router Module port should be DTE. If directly connecting to FRAD, Router or bridge (DTE), Magnum Router Module port should be DCE, with baud rate set to match capability of connected DTE device.

- Magnum Router Module port Link Type configuration is wrong for attached device.
  Verify that the Magnum Router Module port Link Type is set to the correct type for your application. Refer to chapter 9 for sample configurations.

- Wrong cable for application, or defective cable.
  Verify that correct cable is being used (check part number and compare the cable to the Magnum Router Cable Kits described in chapter 2). Only cables purchased from the manufacturer / distributor should be used with this product.

- Carrier problem (if public frame relay carrier is involved)
  If Magnum Router Module configuration is correct and correct cable is being used and properly secured, contact the carrier for assistance.

Symptom: WAN port LED is red and never goes to green.
Solution: Annex-D or LMI mismatch between Magnum Router Module and the carrier.
Make sure that both Magnum Router Module WAN port and the carrier are using the same link management type.

Symptom: M1 to Marathon Base Unit A1 link is not active.
Solution:

- Marathon A1 port defective, or Magnum Router Module port defective.

- Check configuration of the M1 port (it should remain at the factory default settings as seen in chapter 7 of this guide with the exception of the clock speed, which is variable depending on your application). Also check the configuration of the A1 port of your Marathon base unit (a sample of this configuration is provided in Chapter 12). If both configurations and cabling appear to be correct, you may try using one of the WAN ports to connect to A1.

Frame Relay Link Performance Slow/Unreliable

Symptom: Dropped frames showing in manager statistics window.
Solution:

- Frames received for un-configured DLCI's. Delete unused DLCI's from originating equipment.

- Frames received with format errors (bad header information). Format errors will also be indicated in the manager statistics window.
  Verify cable, and verify that attached equipment is properly configured and operating correctly.

- Frames could not be forwarded, due to port speed mismatch and resultant congestion. Make sure the CIR or physical port speed is high enough to handle all configured DLCI's.

Symptom: Time-outs, slow or erratic workstation performance when connecting to server or transferring data over dedicated or frame relay links.
Solution: If there are no format errors or dropped frames shown in manager statistics, and WAN utilization is in the 80% to 100% range, this indicates that the link speed is too slow for the amount of traffic, increase link speed with your Telco / carrier service provider.

Problems Connecting to the Manager

The following will assist you in determining why you are having problems connecting to and using the Magnum Router Module Manager with the Magnum Router Module.

PC to Magnum (Serial) Problems

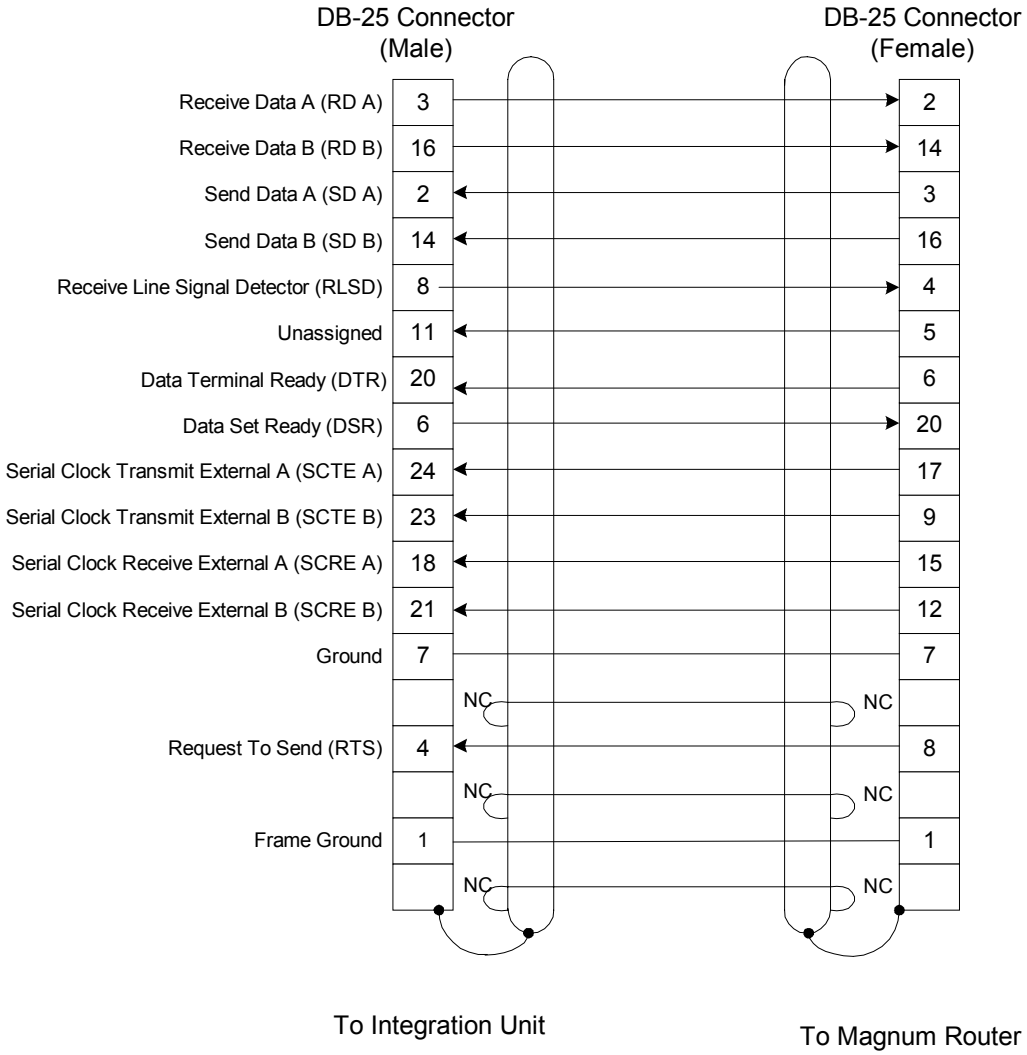
Symptom: When the Magnum Router Manager is launched, it displays a red down arrow in the lower right hand corner of the main menu and never changes to a green up arrow and a valid connection is never established.
Solution: Manager configured for wrong communications port or cabling problem from the PC to the Magnum Router. Configure manager for correct communications port and verify that the proper cable is being used and that it is connected.

Telnet Login Problems

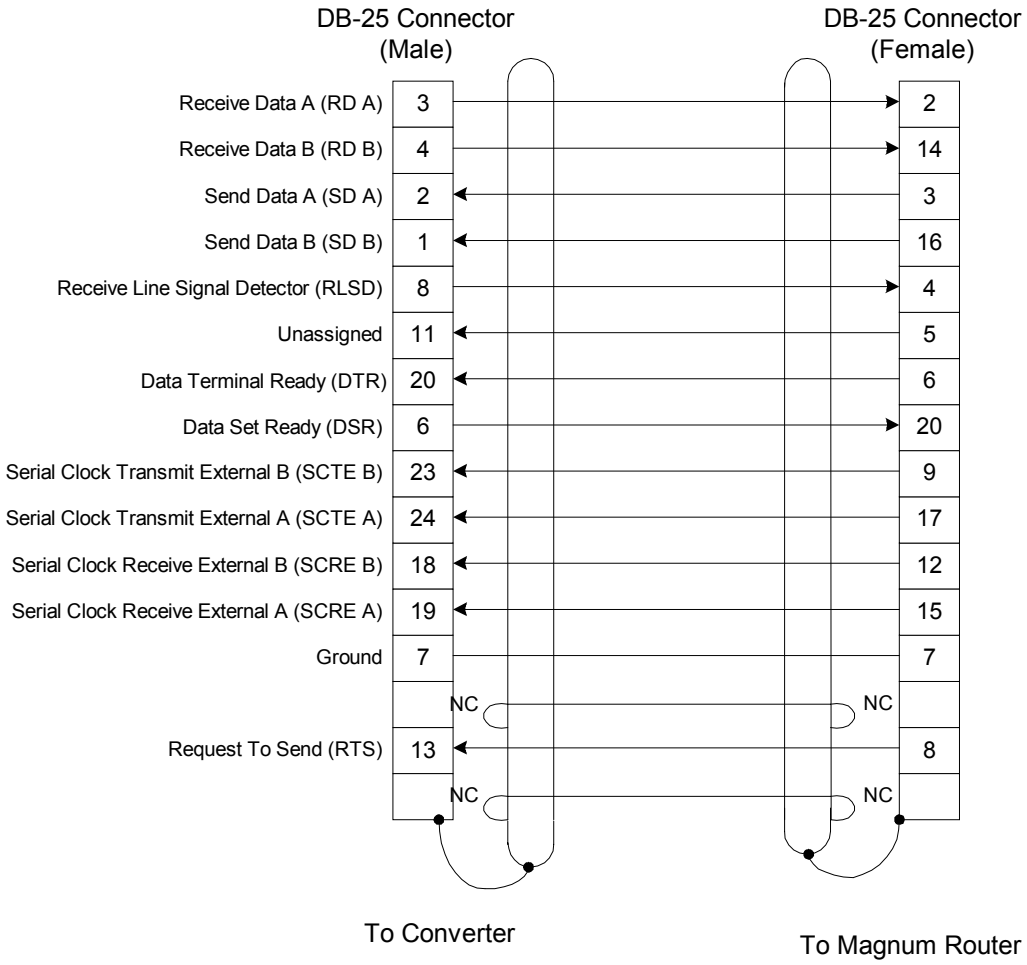
Symptom: Cannot access the Magnum Router using a Telnet Login Method.
Solution: Verify that the PC is able to PING the IP address of the Magnum Router.

Chapter 11: Magnum Router Cable Specifications

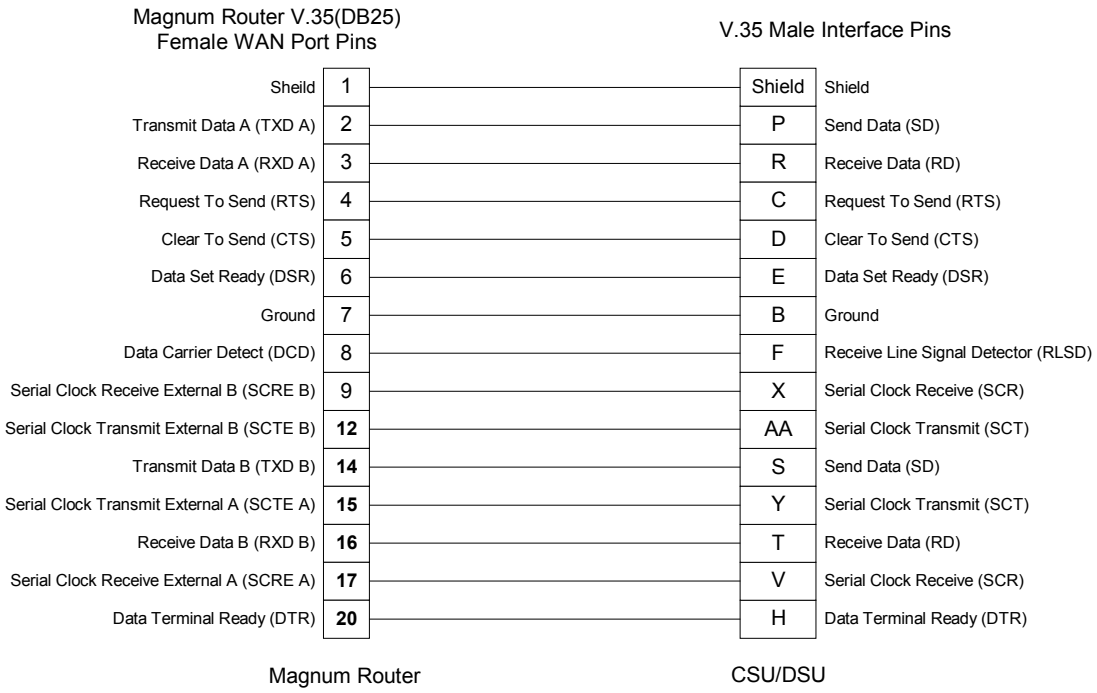
M5000C/M1-A1 (15")


DB-25 Connector (Male)
DB-25 Connector (Female)
Receive Data A (RD A) 3 2
Receive Data B (RD B) 16 14
Send Data A (SD A) 2 3
Send Data B (SD B) 14 16
Receive Line Signal Detector (RLSD) 8 4
Unassigned 11 5
Data Terminal Ready (DTR) 20 6
Data Set Ready (DSR) 6 20
Serial Clock Transmit External A (SCTE A) 24 17
Serial Clock Transmit External B (SCTE B) 23 9
Serial Clock Receive External A (SCRE A) 18 15
Serial Clock Receive External B (SCRE B) 21 12
Ground 7 7
NC NC
Request To Send (RTS) 4 8
NC NC
Frame Ground 1 1
NC NC
To Integration Unit
To Magnum Router

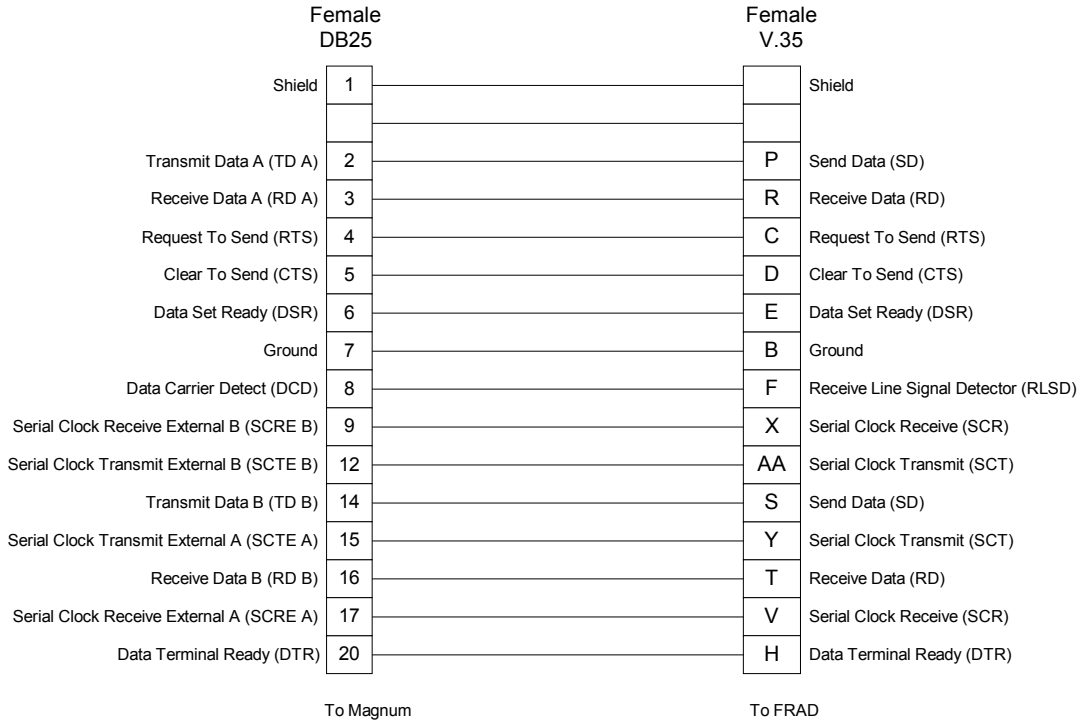
M5000C/M1-A1V35 (18")



M5000C/W123

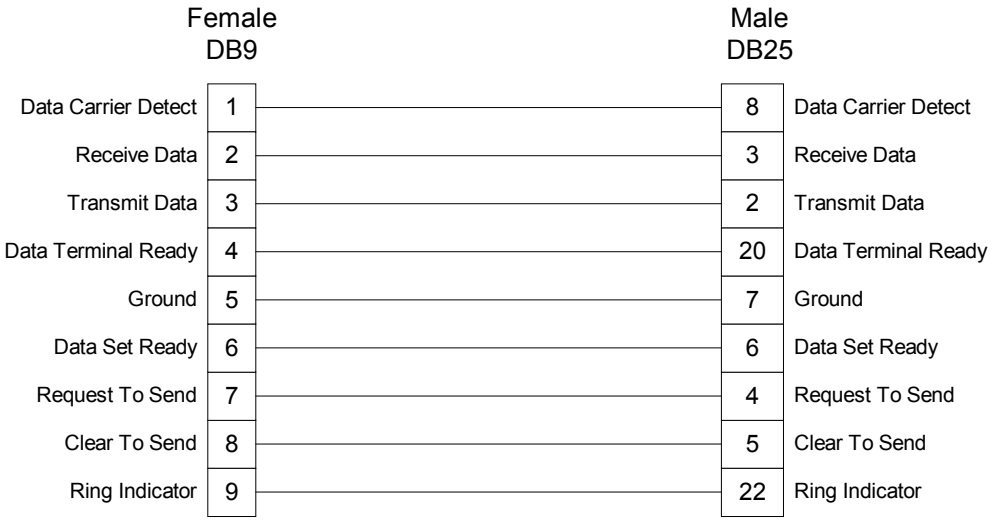

Magnum Router V.35(DB25)
Female WAN Port Pins
V.35 Male Interface Pins
Sheild 1 Shield Shield
Transmit Data A (TXD A) 2 P Send Data (SD)
Receive Data A (RXD A) 3 R Receive Data (RD)
Request To Send (RTS) 4 C Request To Send (RTS)
Clear To Send (CTS) 5 D Clear To Send (CTS)
Data Set Ready (DSR) 6 E Data Set Ready (DSR)
Ground 7 B Ground
Data Carrier Detect (DCD) 8 F Receive Line Signal Detector (RLSD)
Serial Clock Receive External B (SCRE B) 9 X Serial Clock Receive (SCR)
Serial Clock Transmit External B (SCTE B) 12 AA Serial Clock Transmit (SCT)
Transmit Data B (TXD B) 14 S Send Data (SD)
Serial Clock Transmit External A (SCTE A) 15 Y Serial Clock Transmit (SCT)
Receive Data B (RXD B) 16 T Receive Data (RD)
Serial Clock Receive External A (SCRE A) 17 V Serial Clock Receive (SCR)
Data Terminal Ready (DTR) 20 H Data Terminal Ready (DTR)
Magnum Router
CSU/DSU

M5000C/FRAD



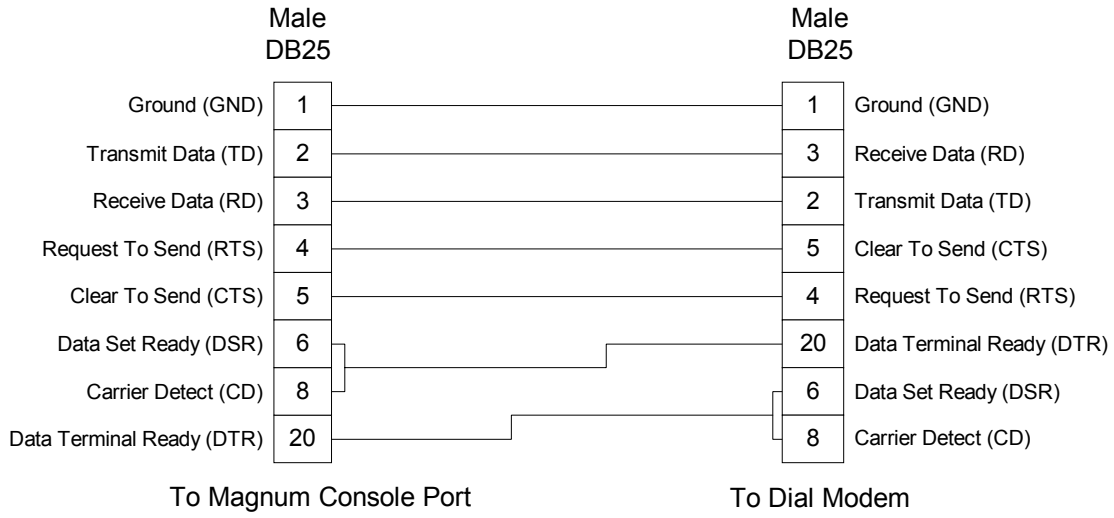
APPLICATION: Magnum Router WAN1,2,3 Port to locally attached FRAD (Frame Relay Access Device)

M5000C/CP

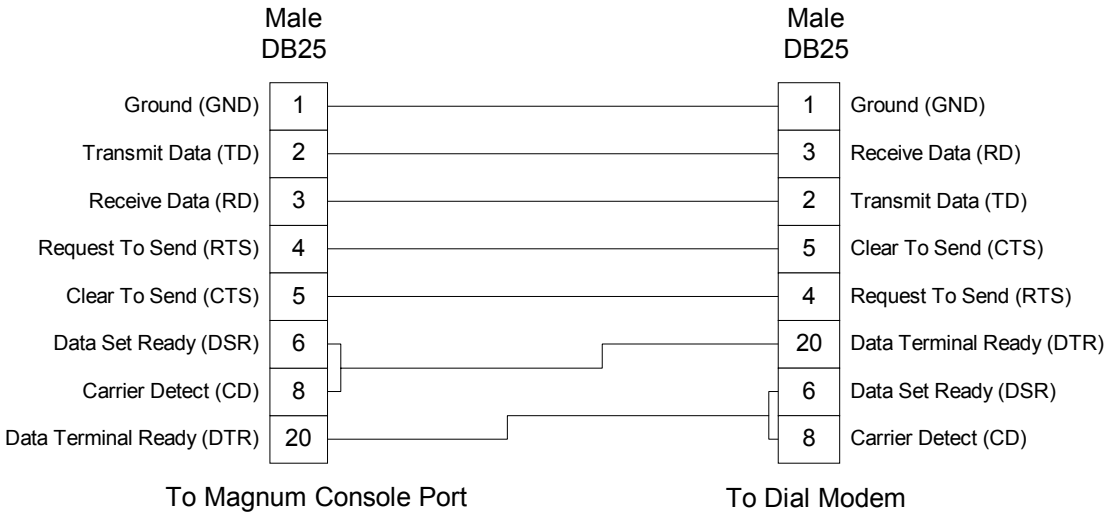


For use between user PC and
Magnum Router console port.

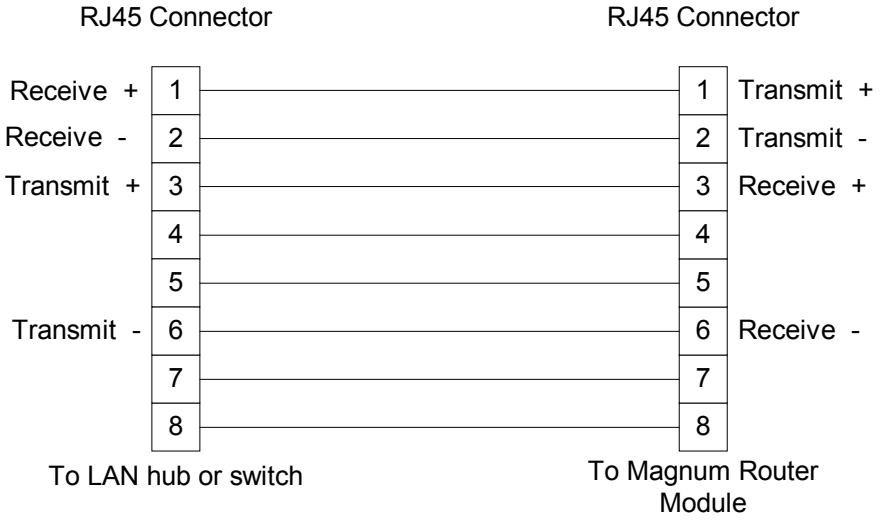
M5000C/MODEM



M5000C/MATRIX



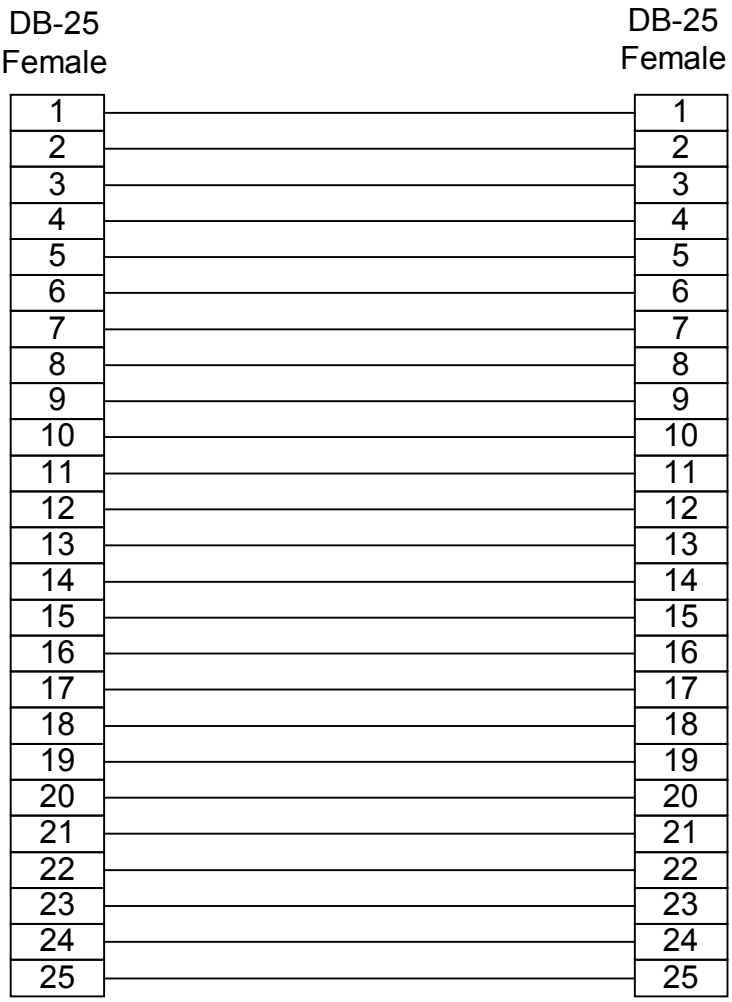
M5000C/CAT5E 10'



RJ45 Cable

- Twisted Pair
- To LAN Module
- Male-to-Male

M5000C/LOCAL



Used for connecting Magnum
WAN Ports together

Chapter 12: Marathon Port Configuration

Frame Relay Port Configuration Example

NOTE: Bolded text items are fields that either need to be changed or are recommended that they be changed.

PORT CONFIGURATION [FRAME RELAY LINK]:
1. ASYNC
2. SYNC
3. INTERCONNECT LINK
4. SECONDARY INTERCONNECT LINK
5. FRAME RELAY LINK

FRAME RELAY LINK PARAMETERS [LEFT/ A01]

1. CLOCK SPEED	[64000]
2. PORT CLOCKING	[TX-EXTERNAL/RX-EXTERNAL]
3. MAXIMUM FRAME SIZE	**[1500]**
4. NETWORK ADDRESS	
5. LOCAL MANAGEMENT PROTOCOL	[ANNEX D]

(LEAVE ALL THESE SETTINGS ALONE)

LOCAL MANAGEMENT PROTOCOL PARAMETERS [LEFT/ A01]

1. FULL STATUS POLLING COUNTER (N391)	[6]
2. ERROR THRESHOLD (N392)	[3]
3. MONITORED EVENTS COUNT (N393)	[4]
4. LINK INTEGRITY VERIFICATION TIMER (T391)	[10]
5. POLLING VERIFICATION TIMER (T392)	[15]
6. ACCESS LINK MODE	[USER]

DLCI PARAMETERS [A01.0053]

1. COMMITTED BURST SIZE FORWARD (BC.FWD)	[0]
2. COMMITTED BURST SIZE BACKWARD (BC.BWD)	[0]
3. EXCESS BURST SIZE FORWARD (BE.FWD)	[0]
4. EXCESS BURST SIZE BACKWARD (BE.BWD)	[0]
5. CIR FORWARD (CIR.FWD) (BPS)	**[128000]**
6. CIR BACKWARD (CIR.BWD) (BPS)	**[128000]**
7. CONGESTION CONTROL	[ENABLE]

Async Channel Configuration Example

NOTE: Bolded text items are fields that need to be changed in order for Marathon Matrix switching to work.

ASYNC CHANNEL CHARACTERISTICS [TOP/ A04]

1. DATA RATE	[9600]
2. CODE LEVEL	[8]
3. PARITY	[NONE]
4. STOP BITS	[1]
5. ECHO	[OFF]
6. CHANNEL END TO HOST/TO TERMINAL	[TERMINAL]
7. XON CHARACTER	[DC1]
8. XOFF CHARACTER	[DC3]
9. BUFFER CONTROL	[XON/XOFF]
10. FLOW CONTROL	[XON/XOFF]
11. CR DELAY	[0]
12. LF DELAY	[0]
13. FF DELAY	[0]

ASYNC CHANNEL FEATURES [TOP/ A04]

1. PRIORITY	[HIGH]
2. EIA CONTROL	[ENABLE]
3. SMOOTH SCROLL	[ON]
4. TANDEM	[NO]
5. FLOW CONTROL STRIP	**[STRIP]**
6. HP ENQ/ACK	[NO]
7. SYNC LOSS DISCONNECT	[NO]
8. COMMAND MODE ENTRY SEQUENCE	[^X BREAK]
9. COMMAND MODE ACCESS	**[DISABLE]**
10. COMMAND FACILITY MAIN MENU ACCESS	**[DISABLE]**
11. LOCAL CHANNEL CONFIGURATION	**[DISABLE]**

ASYNC CHANNEL EXTENDED FEATURES [TOP/ A04]

1. DATA COMPRESSION	[ENABLE]
2. REMOTE CTS CONTROL	[FORCED ON]

ASYNC CHANNEL SWITCHING PARAMETERS [TOP/ A04]

1. CONNECT PROTOCOL	[DEDICATED]
2. UNBALANCED RATES	[ON]
3. CALL INHIBIT	**[YES]**
4. RECEIVE INHIBIT	[NO]
5. CHARACTER SET	[ASCII]
6. MATRIX SWITCHING	[ENABLE]
7. RESOURCE CLASS	
8. DESTINATION NODE/CLASS	
9. CHANNEL PASSWORD	

Chapter 13: Configuration Worksheets

Make copies of the worksheets on these pages, and use them to plan your configuration. Once you've determined the configuration and completed the worksheets, use the Magnum Router Manager to enter the information. See Chapter 7 for detailed instructions on how to enter the configuration worksheet information into the Magnum Router Manager.

Magnum Router Configuration Sheet

Magnum Name:	Date:
	Page:

Notes

Section 1: Port Configuration

Port	DTE	DCE	DIS	Link Type	Link Management	Baud Rate	Notes
M1							
WAN1							
WAN2							
WAN3							

Section 2: WAN Configuration

	Input Port	Output Port	Private DLCI	Public DLCI	CIR	Non-VR DLCI	Notes
1							
2							
3							
4							
5							

Section 3: Master WAN-IP Address

	Network Address	Subnet Mask	DLCI	Notes
1				
2				
3				
4				
5				

Section 4: WAN IP Route Map

	Port	DLCI	Destination Network Address	Subnet Mask	Gateway Address	Notes
1	E1					
2	E1					
3	E1					
4	E1					
5	E1					

Magnum Router Configuration Sheet

Magnum Name:	Date:
	Page:

Notes

Section 5: Advanced Routing

	IP Address	Subnet Mask	Gateway	Notes
1				
2				
3				
4				
5				

Section 6: Ethernet Configuration

	Network Address	Subnet Mask	Notes
1			
2			
3			
4			
5			

Section 7: MVoIP

	DLCI	Source Address	Destination Address	Notes
1				
2				
3				
4				
5				

Magnum Router Configuration Sheet

Magnum Name:	Date:
	Page:

Notes

Section 8: DHCP			
Enabled?	Ethernet IP Address		
DHCP Range Start		DHCP Range End	
Default Lease Time		Maximum Lease Time	
Domain Name			
DNS IP Address #1			
DNS IP Address #2			
DNS IP Address #3			
WINS IP Address #1			
WINS IP Address #2			
WINS IP Address #3			
Default Gateway			

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